Australian Government

UEP Electricity Supply Industry - Generation Sector Training Package

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Links

Companion Volume implementation guides are found in VETNet - https://vetnet.gov.au/Pages/TrainingDocs.aspx?q=1715b9fa-e7bd-441c-bb8d-cf22c9c825a8

UEP20118 Certificate II in ESI Generation - Operations Support

Modification History

Release 2. This is the second release of this qualification in the Electricity Supply Industry - Generation Sector Training Package. The following modification has been made:

- UEPOPS210 Conduct first response within a workplace team deleted due to zero enrolment.

Release 1. This is the first release of this qualification in the UEP Electricity Supply Industry - Generation Sector Training Package.

Qualification Description

Participants gaining this qualification will be able to perform operations support functions in the electrical supply industry. Functions may include the operation of non-critical generation plant systems, lubricating generation plant and performing minor maintenance on electrical and mechanical equipment. It may also include cleaning power generation plant, operating mobile load shifting equipment and observing safe working practices in the workplace.

No licensing, legislative or certification requirements apply to this qualification at the time of publication.

Entry Requirements

There are no entry requirements for this qualification.

Packaging Rules

A total of 360 weighting points comprising 140 core weighting points, plus 220 elective weighting points from the general elective units listed below.

Choose a total of 220 weighting points from the general elective unit list below of which between 0 and 60 weighting points can be taken from Group A. Between 160 and 220 weighting points may be taken from Group B, you may select all your elective units from this group.

Up to 60 weighting points of the general elective units Group A, may be selected, with appropriate contextualisation, from any relevant nationally endorsed Training Package or accredited course, provided that selected units contribute to the vocational outcome of the qualification. Previously assigned weighting points are listed in UEP CVIG, if not listed weighting points will be 10 points unless directed from the ESI Generation Industry Reference Committee (IRC). The general elective units must contribute to the vocational outcomes of the qualification.

Where imported units are selected, care must be taken to ensure that all prerequisite units specified are complied with.

Where a prerequisite unit is attached to a unit, it is identified by this symbol ∟.

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Core units		**Weighting points**
UEENEEE101A	Apply Occupational, Health and Safety regulations, codes and practices in the workplace	20
UEPOPS202	Apply quality systems to work	20
UEPOPS204	Maintain and utilise records	20
UEPOPS209	Perform process plant inspections	30
UEPOPS252	Undertake local systems operations	30
UEPOPS356	Apply environmental and sustainable energy procedures	20

Group A elective units		**Weighting points**
CPCCCM2007B	Use explosive power tools ∟CPCCOHS2001A Apply OHS requirements, policies and procedures in the construction industry	15
CPCCLDG3001A	Licence to perform dogging	30
CPCCLHS3001A	Licence to operate a personnel and materials hoist	30
CPCCLHS3002A	Licence to operate a materials hoist	20
CPCCLRG3001A	Licence to perform rigging basic level ∟CPCCLDG3001A Licence to perform dogging	40
CPCCLRG3002A	Licence to perform rigging intermediate level ∟CPCCLRG3001A Licence to perform rigging basic level	40
CPCCLSF2001A	Licence to erect, alter and dismantle scaffolding basic level	40
CPCCLSF3001A	Licence to erect, alter and dismantle scaffolding intermediate level ∟CPCCLSF2001A Licence to erect, alter and dismantle scaffolding basic level	40
MEM05004C	Perform routine oxy acetylene welding	20

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MEM05007C	Perform manual heating and thermal cutting	20
MEM05012C	Perform routine manual metal arc welding	20
RIIMPO304D	Conduct wheel loader operations	40
RIIMPO308E	Conduct tracked dozer operations	40
RIIMPO309E	Conduct wheeled dozer operations	40
RIIMPO319D	Conduct backhoe/loader operations	50
TLILIC0003	Licence to operate a forklift truck	40
TLILIC0002	Licence to operate a vehicle loading crane (capacity 10 metre tonnes and above)	40
TLILIC0005	Licence to operate a boom-type elevating work platform (boom length 11 metres or more)	30
TLILIC0008	Licence to operate a non-slewing mobile crane (greater than 3 tonnes capacity)	60

Group B elective units		**Weighting points**
UEENEEE102A	Fabricate, assemble and dismantle utilities industry components	40
	∟UEENEEE101A Apply Occupational, Health and Safety regulations, codes and practices in the workplace	
UEPOPS203	Operate and monitor communications system	20
UEPOPS205	Conduct minor mechanical maintenance	40
UEPOPS206	Conduct minor electrical maintenance	40
UEPOPS207	Perform plant lubrication	20
UEPOPS211	Clean plant and equipment	20
UEPOPS232	Transport plant and equipment	20
UEPOPS237	Perform tool store duties	20

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UEPOPS238	Maintain battery banks and cells	30
UEPOPS240	Operate and monitor fuel supply (coal)	40
UEPOPS241	Operate and monitor ash and dust disposal plant	40
UEPOPS242	Operate and monitor dust collection plant	40
UEPOPS243	Operate air conditioning plant	30
UEPOPS244	Operate and monitor site services water systems	30
UEPOPS245	Conduct chemical batching operations	30
UEPOPS246	Operate waste and contaminated water plant	30
UEPOPS247	Operate and monitor an internal combustion single fuel reciprocating engine	40
UEPOPS248	Operate and monitor an internal combustion dual fuel reciprocating engine	40
UEPOPS249	Liaise with stakeholders	20
UEPOPS251	Conduct routine wind turbine maintenance	40
UEPMNT201	Carry out routine work activities in an electricity supply industry generation environment	40

Qualification Mapping Information

This qualification replaces and is equivalent to UEP20112 Certificate II in ESI Generation - Operations Support

Links

Companion Volume implementation guides are found in VETNet - https://vetnet.gov.au/Pages/TrainingDocs.aspx?q=1715b9fa-e7bd-441c-bb8d-cf22c9c825a8

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UEP20218 Certificate II in Remote Area Essential Service

Modification History

Release 1. This is the first release of this qualification in the UEP - Electricity Supply Industry - Generation Sector Training Package.

Qualification Description

Participants gaining this qualification will be able to perform operations in remote area essential services in the electrical supply industry. Functions may include selecting, assembling, setting up and maintaining simple equipment and systems following prescribed workplace procedures and routines, including observing safe working practices.

No licensing, legislative or certification requirements apply to this qualification at the time of publication.

Entry Requirements

There are no entry requirements for this qualification.

Packaging Rules

A total 360 weighting points comprising 160 core weighting points, plus 200 elective weighting points from the general elective units listed below.

Choose a total of 200 weighting point from the general elective units list below of which between 0 and 160 weighting points can be taken from Group A. Between 40 and 200 weighting points may be taken from Group B, you may select all your elective units from this group.

Up to 160 weighting points of the general elective units Group A, may be selected, with appropriate contextualisation, from any relevant nationally endorsed Training Package or accredited course, provided that selected units contribute to the vocational outcome of the qualification. Previously assigned weighting points are listed in UEP CVIG, if not listed weighting points will be 10 points unless directed from the ESI Generation Industry Reference Committee (IRC). The general elective units must contribute to the vocational outcomes of the qualification.

Where imported units are selected, care must be taken to ensure that all prerequisite units specified are complied with.

Where a prerequisite unit is attached to a unit, it is identified by this symbol ∟.

Core units		**Weighting Points**
UEENEEE038B	Participate in development and follow a personal	20

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	competency development plan	
UEENEEE101A	Apply Occupational, Health Safety regulations, codes and practices in the workplace	20
UEENEEE102A	Fabricate, assemble and dismantle utilities industry components ∟UEENEEE101A Apply Occupational, Health Safety regulations, codes and practices in the workplace	40
UEENEEE137A	Document and apply measures to control WHS risks associated with electrotechnology work ∟UEENEEE101A Apply Occupational, Health Safety regulations, codes and practices in the workplace	20
UEENEEK101A	Maintain safety and tidiness of remote area power supply systems ∟UEENEEE101A Apply Occupational, Health Safety regulations, codes and practices in the workplace ∟UEENEEK102A Work safely with remote area power supply systems	20
UEENEEK102A	Work safely with remote area power supply systems ∟UEENEEE101A Apply Occupational, Health Safety regulations, codes and practices in the workplace	20
UEENEEK142A	Apply environmentally and sustainable procedures in the energy sector	20

Group A elective units		**Weighting Points**
UEENEEC001B	Maintain documentation	20
UEENEEC002B	Source and purchase material/parts for installation or service jobs	20
UEENEEC008B	Receive and store materials and equipment for electrotechnology work	20
UEENEEC010B	Deliver a service to customers	20
MEM05012C	Perform routine manual metal arc welding	20
MEM05007C	Perform manual heating and thermal cutting	20

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NWPGEN011	Use maps, plans, drawings and specifications	30
NWPGEN007	Sample and test drinking water	20
NWPGEN008	Sample and test waste water	20
NWPNET002	Prepare and restore work site	30
NWPSOU002	Control vegetation on a site	20
NWPSOU051	Monitor and operate groundwater extraction	20
UEPOPS344	Conduct water conveyance and control	30
NWPSOU011	Maintain catchment and surrounding areas	40
NWPNET023	Maintain and repair network assets for wastewater	40
FDFSUG222A	Operate a waste water treatment system	20
NWPNET041	Monitor and operate water distribution systems	30
NWPSOU054	Monitor and operate pump stations	30
NWPTRT001	Operate and control water treatment processes	30
NWPTRT052	Operate and control hypochlorite disinfection processes	30
NWPTRT012	Operate and control fluoride addition process	20

Group B elective units		**Weighting Points**
UEENEED101A	Use computer applications relevant to a workplace ∟UEENEEE101A Apply Occupational, Health Safety regulations, codes and practices in the workplace.	20
UEENEEE020B	Provide basic instruction in the use of electrotechnology apparatus	20
UEENEEE105A	Fix and secure electrotechnology equipment ∟UEENEEE101A Apply Occupational, Health Safety regulations, codes and practices in the workplace	20
UEENEEE107A	Use drawings, diagrams, schedules, standards, codes and specifications ∟UEENEEE101A Apply Occupational, Health Safety	40

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	regulations, codes and practices in the workplace	
UEENEEE108A	Lay wiring/cabling and terminate accessories for extra low voltage (ELV) circuits ∟UEENEEE101A Apply Occupational, Health Safety regulations, codes and practices in the workplace ∟UEENEEE102A Fabricate, dismantle, assemble of utilities industry components ∟UEENEEE105A Fix and secure electrotechnology equipment ∟UEENEEE107A Use drawings, diagrams, schedules, standards, codes and specifications	40
UEENEEE122A	Carry out preparatory energy sector work activities ∟UEENEEE101A Apply Occupational, Health Safety regulations, codes and practices in the workplace ∟UEENEEE102A Fabricate, assemble and dismantle utilities industry components ∟UEENEEE105A Fix and secure electrotechnology equipment	60
UEENEEE131A	Solve problems in ELV circuits for non-electrical workers ∟UEENEEE101A Apply Occupational, Health Safety regulations, codes and practices in the workplace	40
UEENEEE151A	Transport apparatus, equipment and materials	60
UEENEEK103A	Conduct periodic maintenance of remote area power supply battery banks ∟UEENEEE101A Apply Occupational, Health Safety regulations, codes and practices in the workplace ∟UEENEEE102A Fabricate, dismantle, assemble of utilities industry components ∟UEENEEK101A Maintain safety and tidiness of remote area power supply systems ∟UEENEEE107A Use drawings, diagrams, schedules, standards, codes and specifications ∟UEENEEK102A Work safely with remote area power supply systems ∟UEENEEE131A Solve problems in ELV circuits for non-electrical workers	40

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	∟UEENEEE104A Solve problems in D.C. circuits	
UEENEEK104A	Conduct periodic maintenance of remote area power supply generator sets	40
	∟UEENEEE101A Apply Occupational, Health Safety regulations, codes and practices in the workplace	
	∟UEENEEE102A Fabricate, dismantle, assemble of utilities industry components	
	∟UEENEEK101A Maintain safety and tidiness of remote area power supply systems	
	∟UEENEEE107A Use drawings, diagrams, schedules, standards, codes and specifications	
	∟UEENEEK102A Work safely with remote area power supply systems	
	∟UEENEEE131A Solve problems in ELV circuits for non-electrical workers	
	∟UEENEEE104A Solve problems in D.C. circuits	
UEENEEK105A	Conduct periodic maintenance of remote area power supply photo voltaic arrays	40
	∟UEENEEE101A Apply Occupational, Health Safety regulations, codes and practices in the workplace	
	∟UEENEEE102A Fabricate, dismantle, assemble of utilities industry components	
	∟UEENEEK101A Maintain safety and tidiness of remote area power supply systems	
	∟UEENEEE107A Use drawings, diagrams, schedules, standards, codes and specifications	
	∟UEENEEK102A Work safely with remote area power supply systems	
	∟UEENEEE131A Solve problems in ELV circuits for non-electrical workers	
	∟UEENEEE104A Solve problems in D.C. circuits	
UEENEEK106A	Conduct periodic maintenance of remote area power supply wind generators	40
	∟UEENEEE101A Apply Occupational, Health Safety regulations, codes and practices in the workplace	
	∟UEENEEE102A Fabricate, dismantle, assemble of utilities industry components	
	∟UEENEEK101A Maintain safety and tidiness of	

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	remote area power supply systems	
	∟UEENEEE107A Use drawings, diagrams, schedules, standards, codes and specifications	
	∟UEENEEK102A Work safely with remote area power supply systems	
	∟UEENEEE131A Solve problems in ELV circuits for non-electrical workers	
	∟UEENEEE104A Solve problems in D.C. circuits	
UEENEEK111A	Assemble and connect remote area power supplies	60
	∟UEENEEE101A Apply Occupational, Health Safety regulations, codes and practices in the workplace	
	∟UEENEEE102A Fabricate, assemble and dismantle utilities industry components	
	∟UEENEEE107A Use drawings, diagrams, schedules, standards, codes and specifications	
	∟UEENEEE108A Lay wiring/cabling and terminate accessories for extra low voltage (ELV) circuits	
	∟UEENEEE131A Solve problems in ELV circuits for non-electrical workers	
	∟UEENEEE104A Solve problems in D.C. circuits	
UEENEEK112A	Provide basic sustainable energy solutions for energy reduction in residential premises	40
UEENEEK114A	Promote sustainable energy practices in the community	40
UEENEEK116A	Maintain and repair remote area power generation facilities	120
	∟UEENEEE101A Apply Occupational, Health Safety regulations, codes and practices in the workplace	
	∟UEENEEE102A Fabricate, assemble and dismantle utilities industry components	
	∟UEENEEE107A Use drawings, diagrams, schedules, standards, codes and specifications	
	∟UEENEEK101A Maintain safety and tidiness of remote area power supply systems	
	∟UEENEEK102A Work safely with remote area power supply systems	
	∟UEENEEK104A Conduct periodic maintenance of remote area power supply generator sets	

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	Electrotechnology Pathway Group	
	∟UEENEEE104A Solve problems in D.C. circuits	
	Remote Area Pathway Group	
	∟UEENEEE131A Solve problems in ELV circuits for non-electrical workers	
UEENEEK117A	Maintain and repair facilities associated with remote area essential service operations	120
	∟UEENEEE101A Apply Occupational, Health Safety regulations, codes and practices in the workplace	
	∟UEENEEE102A Fabricate, assemble and dismantle utilities industry components	
	∟UEENEEE103A Solve problems in ELV single path circuits	
	∟UEENEEE131A Solve problems in ELV circuits for non-electrical workers	
	∟UEENEEE104A Solve problems in D.C. circuits	
UEENEEK118A	Maintain and monitor remote area essential service (RAPS) operations	120
	∟UEENEEE101A Apply Occupational, Health Safety regulations, codes and practices in the workplace	
	∟UEENEEK102A Work safely with remote area power supply systems	
UEENEEK123A	Carry out basic repairs to renewable energy apparatus	80
	∟UEENEEE104A Solve problems in D.C. circuits	
	∟UEENEEE108A Lay wiring/cabling and terminate accessories for extra low voltage (ELV) circuits	
	∟UEENEEG106A Terminate cables, cords and accessories for low voltage circuits	
UEENEEP024A	Attach cords and plugs to electrical equipment for connection to a single phase 230-volt supply	20
	∟UEENEEE101A Apply Occupational, Health Safety regulations, codes and practices in the workplace	
UEENEEP026A	Conduct in-service safety testing of electrical cord connected equipment and cord assemblies	20
	∟UEENEEE101A Apply Occupational, Health Safety regulations, codes and practices in the workplace	

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Qualification Mapping Information

This qualification replaces and is equivalent to UEE21311 - Certificate II in Remote Area Essential Service

Links

Companion Volume implementation guides are found in VETNet - https://vetnet.gov.au/Pages/TrainingDocs.aspx?q=1715b9fa-e7bd-441c-bb8d-cf22c9c825a8

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UEP30118 Certificate III in ESI Generation - Systems Operations

Modification History

Release 2. This is the second release of this qualification in the Electricity Supply Industry - Generation Sector Training Package. The following modification has been made:

- UEPOPS334 Operate and monitor a wind generator deleted due to zero enrolment.

Release 1. This is the first release of this qualification in the UEP Electricity Supply Industry - Generation Sector Training Package.

Qualification Description

Participants gaining this qualification will be able to perform systems operations functions in the electrical supply industry. Functions may include the operation of power generation plant systems, isolating power generation plant systems for work and undertaking routine maintenance on power generation plant and equipment. It may also include working with civil plant and infrastructure and observing safe working practices.

No licensing, legislative or certification requirements apply to this qualification at the time of publication.

Entry Requirements

There are no entry requirements for this qualification.

Packaging Rules

A total of 1120 weighting points comprising 330 core weighting points, plus 790 elective weighting points from the general elective units listed below.

Choose a total of 790 weighting points from the general elective unit list below of which between 0 and 160 weighting points can be taken from Group A. Between 470 and 630 weighting points may be taken from Group B, you may select all your elective units from this group.

Up to160 weighting points of the general elective units Group A, may be selected, with appropriate contextualisation, from any relevant nationally endorsed Training Package or accredited course, provided that selected units contribute to the vocational outcome of the qualification. Previously assigned weighting points are listed in UEP CVIG, if not listed weighting points will be 10 points unless directed from the ESI Generation Industry Reference Committee (IRC). The general elective units must contribute to the vocational outcomes of the qualification.

Where imported units are selected, care must be taken to ensure that all prerequisite units specified are complied with.

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Where a prerequisite unit is attached to a unit, it is identified by this symbol ∟.

Core units		**Weighting points**
UEENEEE101A	Apply Occupational Health and Safety regulations, codes and practices in the workplace	20
UEPOPS202	Apply quality systems to work	20
UEPOPS204	Maintain and utilise records	20
UEPOPS209	Perform process plant inspections	30
UEPOPS249	Liaise with stakeholders	20
UEPOPS252	Undertake local systems operations	30
UEPOPS301	Conduct single energy source isolation procedures for permit to work	40
UEPOPS317	Operate and monitor fixed fire protection systems	30
UEPOPS342	Analyse single protection device operation	60
UEPOPS347	Operate and monitor supervisory, control and data acquisition systems	40
UEPOPS356	Apply environmental and sustainable energy procedures	20
UEPOPS364	Ensure compliance with Work, Health and Safety policy and procedures	20

Group A elective units		**Weighting points**
BSBFLM303	Contribute to effective workplace relationships	40
BSBFLM305	Support operational plan	40
BSBFLM306	Provide workplace information and resourcing plans	40
BSBFLM309	Support continuous improvement systems and processes	40
BSBFLM311	Support a workplace learning environment	40
BSBFLM312	Contribute to team effectiveness	40

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BSBINN301	Promote innovation in a team environment	40
BSBWOR301	Organise personal work priorities and development	40
CPCCCM2007B	Use explosive power tools ∟CPCCOHS2001A Apply OHS requirements, policies and procedures in the construction industry	15
CPCCLDG3001A	Licence to perform dogging	30
CPCCLHS3001A	Licence to operate a personnel and materials hoist	30
CPCCLHS3002A	Licence to operate a materials hoist	20
CPCCLRG3001A	Licence to perform rigging basic level ∟CPCCLDG3001A Licence to perform dogging	40
CPCCLRG3002A	Licence to perform rigging intermediate level ∟CPCCLRG3001A Licence to perform rigging basic level	40
CPCCLRG4001A	Licence to perform rigging advanced level ∟CPCCLRG3002A Licence to perform rigging intermediate level	40
CPCCLSF2001A	Licence to erect, alter and dismantle scaffolding basic level	40
CPCCLSF3001A	Licence to erect, alter and dismantle scaffolding intermediate level ∟CPCCLSF2001A Licence to erect, alter and dismantle scaffolding basic level	40
CPCCLSF4001A	Licence to erect, alter and dismantle scaffolding advanced level ∟CPCCLSF3001A Licence to erect, alter and dismantle scaffolding intermediate level	40
MEM05004C	Perform routine oxy acetylene welding	20
MEM05007C	Perform manual heating and thermal cutting	20
MEM05012C	Perform routine manual metal arc welding	20

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NWPSOU027	Route floods through storages	50
NWPSOU022	Monitor and control dam operations	50
NWPSOU023	Monitor and implement dam maintenance	50
RIIMPO304D	Conduct wheel loader operations	40
RIIHAN309E	Conduct telescopic materials handler operations	80
RIIMPO308E	Conduct tracked dozer operations	40
RIIMPO309E	Conduct wheeled dozer operations	40
RIIMPO318E	Conduct civil construction skid steer loader operations	70
RIIMPO319D	Conduct backhoe/loader operations	50
TLILIC0003	Licence to operate a forklift truck	40

Group B elective units		**Weighting points**
UEENEEE102A	Fabricate, assemble and dismantle utilities industry components	40
	∟ UEENEEE101A Apply Occupational Health and Safety regulations, codes and practices in the workplace	
UEPOPS203	Operate and monitor communications system	20
UEPOPS205	Conduct minor mechanical maintenance	40
UEPOPS206	Conduct minor electrical maintenance	40
UEPOPS207	Perform plant lubrication	20
UEPOPS211	Clean plant and equipment	20
UEPOPS309	Operate and monitor air conditioning plant and ventilation systems	20
UEPOPS310	Operate bulk coal handling plant	40
UEPOPS311	Operate fabric filter dust collection plant	20

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UEPOPS312	Operate and monitor fuel supply	20
UEPOPS313	Operate and monitor boiler draught system	40
UEPOPS314	Operate and monitor fuel firing plant (gas or oil)	40
UEPOPS315	Operate and monitor fuel firing plant (coal)	40
UEPOPS316	Operate and monitor boiler steam/water cycle	40
UEPOPS318	Operate and monitor compressed gas systems	30
UEPOPS319	Operate and monitor gas production plant	30
UEPOPS320	Operate and monitor compressed air systems	30
UEPOPS321	Operate and monitor water treatment plant	30
UEPOPS322	Operate and monitor alkalinity reduction plant	30
UEPOPS323	Operate and monitor reverse osmosis plant	30
UEPOPS324	Operate and monitor brine concentrator plant	30
UEPOPS325	Operate and monitor water quality monitoring systems	30
UEPOPS326	Operate and monitor oil systems	30
UEPOPS327	Monitor and maintain civil assets	30
UEPOPS328	Undertake dam safety surveillance	30
UEPOPS329	Operate and monitor auxiliary steam systems	40
UEPOPS330	Operate and monitor heat exchangers and cooling systems	40
UEPOPS331	Operate and monitor water systems (condensate and feedwater)	40
UEPOPS332	Operate and monitor condenser and auxiliary cooling systems	40
UEPOPS333	Operate and monitor HRSG hot gas control system	40

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UEPOPS335	Operate a hydro generator synchronous condenser pump unit	60
UEPOPS336	Manage, operate and monitor a gas turbine unit	60
UEPOPS337	Maintain quality systems within the team ∟UEPOPS202 Apply quality systems to work	20
UEPOPS338	Facilitate workplace communication	20
UEPOPS339	Operate and monitor a boiler unit	60
UEPOPS340	Operate and monitor a steam turbine	60
UEPOPS343	Operate hydroelectric generating plant and auxiliary equipment	60
UEPOPS344	Conduct water conveyance and control	30
UEPOPS345	Implement dam safety surveillance procedures	30
UEPOPS346	Conduct non-routine operational testing	60
UEPOPS349	Operate local H.V. switchgear	40
UEPOPS351	Operate H.V. condition changing apparatus	60
UEPOPS352	Conduct operational checks on in-service mechanical plant	40
UEPOPS354	Operate and monitor dual fuel firing plant	80
UEPOPS355	Monitor the implementation of under frequency load shedding	60
UEPOPS357	Operate local L.V. switchgear	40
UEPOPS358	Monitor and maintain wind farm civil assets	40
UEPOPS359	Monitor climatic conditions for renewable energy production	40
UEPOPS360	Operate and monitor a hydro turbine	60
UEPOPS361	Operate and monitor hydro plant auxiliary systems	60

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UEPOPS362	Operate and monitor generator/alternator	60
UEPOPS368	Operate manual systems ∟UEPOPS252 Undertake local systems operations	30
UEPOPS369	Respond to a critical incident	40
UEPOPS370	Facilitate the use of contingency plans for power generation facilities	60
UEPOPS371	Carry out operational checks on in-service electrical plant	40

Qualification Mapping Information

This qualification replaces and is equivalent to UEP30112 Certificate III in ESI Generation - Systems Operations

Links

Companion Volume implementation guides are found in VETNet - https://vetnet.gov.au/Pages/TrainingDocs.aspx?q=1715b9fa-e7bd-441c-bb8d-cf22c9c825a8

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UEP30218 Certificate III in ESI Generation - Operations

Modification History

Release 2. This is the second release of this qualification in the Electricity Supply Industry - Generation Sector Training Package. The following modification has been made:

- UEPOPS334 Operate and monitor a wind generator deleted due to zero enrolment.

Release 1. This is the first release of this qualification in the UEP - Electricity Supply Industry - Generation Sector Training Package.

Qualification Description

Participants gaining this qualification will be able to perform operations functions in the electrical supply industry. Functions may include the operation of power generation plant systems, isolating power generation plant systems for work and routine maintenance on power generation plant and equipment. It may also include working with civil plant and infrastructure and observing safe working practices.

No licensing, legislative or certification requirements apply to this qualification at the time of publication.

Entry Requirements

There are no entry requirements for this qualification.

Packaging Rules

A total 960 weighting points comprising 340 core weighting points, plus 620 general elective weighting points from the general elective units listed below.

Choose a total of 620 weighting points from the elective units list below of which 160 weighting points can be taken from Group A; between 460 and 620 weighting points may be taken from Group B, you may select all your elective units from this group.

Up to 160 weighting points of the general elective units Group A, may be selected, with appropriate contextualisation, from any relevant nationally endorsed Training Package or accredited course, provided that selected units contribute to the vocational outcome of the qualification. Previously assigned weighting points are listed in UEP CVIG, if not listed weighting points will be 10 points unless directed from the ESI Generation Industry Reference Committee (IRC). The general elective units must contribute to the vocational outcomes of the qualification.

Where imported units are selected, care must be taken to ensure that all prerequisite units specified are complied with.

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Where a prerequisite unit is attached to a unit, it is identified by this symbol ∟.

Core units		**Weighting points**
UEENEEE101A	Apply Occupational, Health and Safety regulations, codes and practices in the workplace	20
UEPOPS202	Apply quality systems to work	20
UEPOPS204	Maintain and utilise records	20
UEPOPS209	Perform process plant inspections	30
UEPOPS249	Liaise with stakeholders	20
UEPOPS252	Undertake local systems operations	30
UEPOPS301	Conduct single energy source isolation procedures for permit to work	40
UEPOPS352	Conduct operational checks on in-service mechanical plant	40
UEPOPS356	Apply environmental and sustainable energy procedures	20
UEPOPS364	Ensure compliance with Work, Health and Safety policy and procedures	20
UEPOPS369	Respond to a critical incident	40
UEPOPS371	Carry out operational checks on in-service electrical plant	40

Group A elective units		**Weighting points**
BSBFLM303	Contribute to effective workplace relationships	40
BSBFLM305	Support operational plan	40
BSBFLM306	Provide workplace information and resourcing plans	40
BSBFLM309	Support continuous improvement systems and processes	40
BSBFLM311	Support a workplace learning environment	40
BSBFLM312	Contribute to team effectiveness	40

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BSBINN301	Promote innovation in a team environment	40
BSBWOR301	Organise personal work priorities and development	40
CPCCCM2007B	Use explosive power tools	15
	∟CPCCOHS2001A Apply OHS requirements, policies and procedures in the construction industry	
CPCCLHS3001A	Licence to operate a personnel and materials hoist	30
CPCCLHS3002A	Licence to operate a materials hoist	20
CPCCLDG3001A	Licence to perform dogging	30
CPCCLRG3001A	Licence to perform rigging basic level	40
	∟CPCCLDG3001A Licence to perform dogging	
CPCCLRG3002A	Licence to perform rigging intermediate level	40
	∟CPCCLRG3001A Licence to perform rigging basic level	
CPCCLRG4001A	Licence to perform rigging advanced level	40
	∟CPCCLRG3002A Licence to perform rigging intermediate level	
CPCCLSF2001A	Licence to erect, alter and dismantle scaffolding basic level	40
CPCCLSF3001A	Licence to erect, alter and dismantle scaffolding intermediate level	40
	∟CPCCLSF2001A Licence to erect, alter and dismantle scaffolding basic level	
CPCCLSF4001A	Licence to erect, alter and dismantle scaffolding advanced level	40
	∟CPCCLSF3001A Licence to erect, alter and dismantle scaffolding intermediate level	
MEM05004C	Perform routine oxy acetylene welding	20
MEM05007C	Perform manual heating and thermal cutting	20
MEM05012C	Perform routine manual metal arc welding	20

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NWPSOU027	Route floods through storages	50
NWPSOU022	Monitor and control dam operations	50
NWPSOU023	Monitor and implement dam maintenance	50
RIIMPO304D	Conduct wheel loader operations	40
RIIHAN309E	Conduct telescopic materials handler operations	80
RIIMPO308E	Conduct tracked dozer operations	40
RIIMPO309E	Conduct wheeled dozer operations	40
RIIMPO318E	Conduct civil construction skid steer loader operations	70
RIIMPO319D	Conduct backhoe/loader operations	50
TLILIC0003	Licence to operate a forklift truck	40

Group B elective units		**Weighting points**
UEENEEE102A	Fabricate, assemble and dismantle utilities industry components	40
UEPOPS203	Operate and monitor communications system	20
UEPOPS205	Conduct minor mechanical maintenance	40
UEPOPS206	Conduct minor electrical maintenance	40
UEPOPS207	Perform plant lubrication	20
UEPOPS211	Clean plant and equipment	20
UEPOPS309	Operate and monitor air conditioning plant and ventilation systems	20
UEPOPS310	Operate bulk coal handling plant	40
UEPOPS311	Operate fabric filter dust collection plant	20
UEPOPS312	Operate and monitor fuel supply	20

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UEPOPS313	Operate and monitor boiler draught system	40
UEPOPS314	Operate and monitor fuel firing plant (gas or oil)	40
UEPOPS315	Operate and monitor fuel firing plant (coal)	40
UEPOPS316	Operate and monitor boiler steam/water cycle	40
UEPOPS317	Operate and monitor fixed fire protection systems	30
UEPOPS318	Operate and monitor compressed gas systems	30
UEPOPS319	Operate and monitor gas production plant	30
UEPOPS320	Operate and monitor compressed air systems	30
UEPOPS321	Operate and monitor water treatment plant	30
UEPOPS322	Operate and monitor alkalinity reduction plant	30
UEPOPS323	Operate and monitor reverse osmosis plant	30
UEPOPS324	Operate and monitor brine concentrator plant	30
UEPOPS325	Operate and monitor water quality monitoring systems	30
UEPOPS326	Operate and monitor oil systems	30
UEPOPS327	Monitor and maintain civil assets	30
UEPOPS328	Undertake dam safety surveillance	30
UEPOPS329	Operate and monitor auxiliary steam systems	40
UEPOPS330	Operate and monitor heat exchangers and cooling systems	40
UEPOPS331	Operate and monitor water systems (condensate and feedwater)	40
UEPOPS332	Operate and monitor condenser and auxiliary cooling systems	40
UEPOPS333	Operate and monitor HRSG hot gas control system	40

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UEPOPS335	Operate a hydro generator synchronous condenser pump unit	60
UEPOPS336	Manage, operate and monitor a gas turbine unit	60
UEPOPS337	Maintain quality systems within the team ∟UEPOPS202 Apply quality systems to work	20
UEPOPS338	Facilitate workplace communication	20
UEPOPS339	Operate and monitor a boiler unit	60
UEPOPS340	Operate and monitor a steam turbine	60
UEPOPS342	Analyse single protection device operation	60
UEPOPS343	Operate hydroelectric generating plant and auxiliary equipment	60
UEPOPS344	Conduct water conveyance and control	30
UEPOPS345	Implement dam safety surveillance procedures	30
UEPOPS346	Conduct non-routine operational testing	60
UEPOPS347	Operate and monitor supervisory, control and data acquisition systems	40
UEPOPS349	Operate local H.V. switchgear	40
UEPOPS351	Operate H.V. condition changing apparatus	60
UEPOPS354	Operate and monitor dual fuel firing plant	80
UEPOPS355	Monitor the implementation of under frequency load shedding	60
UEPOPS357	Operate local L.V. switchgear	40
UEPOPS358	Monitor and maintain wind farm civil assets	40
UEPOPS359	Monitor climatic conditions for renewable energy production	40
UEPOPS360	Operate and monitor a hydro turbine	60

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UEPOPS361	Operate and monitor hydro plant auxiliary systems	60
UEPOPS362	Operate and monitor generator/alternator	60
UEPOPS368	Operate manual systems ∟UEPOPS252 Undertake local systems operations	30
UEPOPS370	Facilitate the use of contingency plans for power generation facilities	60

Qualification Mapping Information

This qualification replaces and is equivalent to UEP30212 Certificate III in ESI Generation - Operations

Links

Companion Volume implementation guides are found in VETNet - https://vetnet.gov.au/Pages/TrainingDocs.aspx?q=1715b9fa-e7bd-441c-bb8d-cf22c9c825a8

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UEP40118 Certificate IV in ESI Generation - Systems Operations

Modification History

Release 2. This is the second release of this qualification in the Electricity Supply Industry - Generation Sector Training Package. The following modification has been made:

- UEPOPS334 Operate and monitor a wind generator and UEPOPS210 Conduct first response within a workplace team deleted due to zero enrolment.

Release 1. This is the first release of this qualification in the UEP - Electricity Supply Industry - Generation Sector Training Package.

Qualification Description

Participants gaining this qualification will be able to perform systems operations functions in the electrical supply industry. Functions may include the remote operation of network equipment, the isolating of power generation plant and equipment for work, estimating costs and observing safe working practices. It may also include the supervision of others and the coordination of work activities.

No licensing, legislative or certification requirements apply to this qualification at the time of publication.

Entry Requirements

There are no entry requirements for this qualification.

Packaging Rules

A **total** 1280 weighting points comprising 500 core weighting points, plus 780 general elective weighting points from the general elective units listed below.

Choose a total of 780 weighting points from the general elective units list below of which between 0 and 220 weighting points can be taken from Group A. A total of 700 weighting points may be taken from Group B, at least 100 weighting points must be selected from this group. Between 100 and 780 weighting points may be selected from Group C, you may select all your elective units from this group.

Up to 220 weighting points of the general elective units Group A, may be selected, with appropriate contextualisation, from any relevant nationally endorsed Training Package or accredited course, provided that selected units contribute to the vocational outcome of the qualification. Previously assigned weighting points are listed in UEP CVIG, if not listed weighting points will be 10 points unless directed from the ESI Generation Industry Reference Committee (IRC). The general elective units must contribute to the vocational outcomes of the qualification.

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Where imported units are selected, care must be taken to ensure that all prerequisite units specified are complied with.

Where a prerequisite unit is attached to a unit, it is identified by this symbol ∟.

Core units		**Weighting points**
UEENEEE117A	Implement and monitor energy sector OHS policies and procedures	20
UEENEEE101A	Apply Occupational Health and Safety regulations, codes and practices in the workplace	20
UEPOPS202	Apply quality systems to work	20
UEPOPS301	Conduct single energy source isolation procedures for permit to work	40
UEPOPS337	Maintain quality systems within the team ∟UEPOPS202 Apply quality systems to work	20
UEPOPS342	Analyse single protection device operation	60
UEPOPS347	Operate and monitor supervisory, control and data acquisition systems	40
UEPOPS369	Respond to a critical incident	40
UEPOPS417	Monitor and implement environmental site plans and procedures	20
UEPOPS420	Coordinate network/system	40
UEPOPS423	Plan a scheduled outage	40
UEPOPS426	Interpret and analyse multi-operation protection devices ∟UEPOPS342 Analyse single protection device operation	40
UEPOPS428	Develop H.V. switching programs	40
UEPOPS439	Plan and organise work	30
UEPOPS440	Coordinate team activities	30

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Group A elective units		**Weighting points**
BSBCUS401	Coordinate implementation of customer service strategies	40
BSBINM401	Implement workplace information system	40
BSBINN301	Promote innovation in a team environment	40
BSBLED401	Develop teams and individuals	40
BSBMGT402	Implement operational plan	40
BSBMGT403	Implement continuous improvement	40
BSBLDR402	Lead effective workplace relationships	50
BSBLDR403	Lead team effectiveness	50
BSBWOR404	Develop work priorities	40
MEM05004C	Perform routine oxy acetylene welding	20
MEM05007C	Perform manual heating and thermal cutting	20
MEM05012C	Perform routine manual metal arc welding	20
TAEDEL301	Provide work skill instruction	40
UEENEEC005B	Estimate electrotechnology projects	40
UEENEEE124A	Compile and produce an energy sector detailed report	60

Group B elective units		**Weighting points**
UEPOPS203	Operate and monitor communications system	20
UEPOPS252	Undertake local systems operations	30
UEPOPS309	Operate and monitor air conditioning plant and ventilation systems	20
UEPOPS310	Operate bulk coal handling plant	40

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UEPOPS311	Operate fabric filter dust collection plant	20
UEPOPS312	Operate and monitor fuel supply	20
UEPOPS313	Operate and monitor boiler draught system	40
UEPOPS314	Operate and monitor fuel firing plant (gas or oil)	40
UEPOPS315	Operate and monitor fuel firing plant (coal)	40
UEPOPS316	Operate and monitor boiler steam/water cycle	40
UEPOPS317	Operate and monitor fixed fire protection systems	30
UEPOPS318	Operate and monitor compressed gas systems	30
UEPOPS319	Operate and monitor gas production plant	30
UEPOPS320	Operate and monitor compressed air systems	30
UEPOPS321	Operate and monitor water treatment plant	30
UEPOPS322	Operate and monitor alkalinity reduction plant	30
UEPOPS323	Operate and monitor reverse osmosis plant	30
UEPOPS324	Operate and monitor brine concentrator plant	30
UEPOPS325	Operate and monitor water quality monitoring systems	30
UEPOPS326	Operate and monitor oil systems	30
UEPOPS327	Monitor and maintain civil assets	30
UEPOPS328	Undertake dam safety surveillance	30
UEPOPS329	Operate and monitor auxiliary steam systems	40
UEPOPS330	Operate and monitor heat exchangers and cooling systems	40
UEPOPS331	Operate and monitor water systems (condensate and feedwater)	40

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UEPOPS332	Operate and monitor condenser and auxiliary cooling systems	40
UEPOPS333	Operate and monitor HRSG hot gas control system	40
UEPOPS335	Operate a hydro generator synchronous condenser pump unit	60
UEPOPS336	Manage, operate and monitor a gas turbine unit	60
UEPOPS338	Facilitate workplace communication	20
UEPOPS339	Operate and monitor a boiler unit	60
UEPOPS340	Operate and monitor a steam turbine	60
UEPOPS343	Operate hydroelectric generating plant and auxiliary equipment	60
UEPOPS344	Conduct water conveyance and control	30
UEPOPS345	Implement dam safety surveillance procedures	30
UEPOPS346	Conduct non-routine operational testing	60
UEPOPS349	Operate local H.V. switchgear	40
UEPOPS351	Operate H.V. condition changing apparatus	60
UEPOPS352	Conduct operational checks on in-service mechanical plant	40
UEPOPS354	Operate and monitor dual fuel firing plant	80
UEPOPS355	Monitor the implementation of under frequency load shedding	60
UEPOPS356	Apply environmental and sustainable energy procedures	20
UEPOPS357	Operate local L.V. switchgear	40
UEPOPS358	Monitor and maintain wind farm civil assets	40
UEPOPS359	Monitor climatic conditions for renewable energy production	40

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UEPOPS360	Operate and monitor a hydro turbine	60
UEPOPS361	Operate and monitor hydro plant auxiliary systems	60
UEPOPS362	Operate and monitor generator/alternator	60
UEPOPS364	Ensure compliance with Work, Health and Safety policy and procedures	20
UEPOPS368	Operate manual systems ∟UEPOPS252 Undertake local systems operations	30
UEPOPS370	Facilitate the use of contingency plans for power generation facilities	60
UEPOPS371	Carry out operational checks on in-service electrical plant	40

Group C elective units		**Weighting points**
UEPOPS402	Conduct multiple energy source isolation procedures for permit to work ∟UEPOPS301 Conduct single energy source isolation procedures for permit to work.	40
UEPOPS403	Coordinate permit to work system ∟UEPOPS402 Conduct multiple energy source isolation procedures for permit to work	40
UEPOPS404	Coordinate first response team operation	20
UEPOPS405	Operate and monitor A.C. electrical systems	30
UEPOPS406	Operate and monitor D.C. electrical systems	30
UEPOPS407	Start and run up gas turbine	60
UEPOPS408	Shut down a gas turbine	60
UEPOPS409	Start up a boiler unit	60
UEPOPS410	Shut down a boiler unit	60
UEPOPS411	Run up a steam turbine	60

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UEPOPS412	Undertake commissioning and decommissioning	30
UEPOPS413	Coordinate operational strategies for power production	20
UEPOPS414	Perform risk analysis of generation plant	20
UEPOPS416	Monitor implementation of quality control for production and maintenance ∟UEPOPS337 Maintain quality systems within the team	20
UEPOPS419	Shut down a steam turbine	60
UEPOPS422	Schedule generation	40
UEPOPS424	Coordinate local H.V. networks	40
UEPOPS425	Produce maintenance plans for generation production plant	40
UEPOPS430	Control permit to work operations	40
UEPOPS431	Collect and analyse hydrological and meteorological data ∟UEPOPS209 Perform process plant inspections	20
UEPOPS432	Start up a heat recovery steam generator unit ∟UEPOPS333 Operate and monitor HRSG hot gas control system	30
UEPOPS433	Operate and monitor a heat recovery steam generator unit ∟UEPOPS333 Operate and monitor HRSG hot gas control system ∟UEPOPS407 Start and run up gas turbine ∟UEPOPS432 Start up a heat recovery steam generator unit	20
UEPOPS434	Shut down a heat recovery steam generator unit ∟UEPOPS333 Operate and monitor HRSG hot gas control system ∟UEPOPS408 Shut down a gas turbine	30

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UEPOPS435	Operate and monitor flue gas (NOx) mitigation systems	30
UEPOPS437	Manage system restart	40
UEPOPS441	Operate and monitor system equipment	30
UEPOPS442	Monitor and coordinate the operation of a combined cycle gas turbine unit ∟UEPOPS314 Operate and monitor fuel firing plant (gas or oil) ∟UEPOPS333 Operate and monitor HRSG hot gas control system ∟UEPOPS336 Operate and monitor gas turbine unit ∟UEPOPS340 Operate and monitor a steam turbine	60
UEPOPS443	Coordinate wind farm operations	40
UEPOPS444	Start and run-up a hydro turbine	60
UEPOPS445	Shut down a hydro turbine	60
UEPOPS446	Operate and monitor hydro unit control and protection systems	80
UEPOPS447	Coordinate photovoltaic solar power plant operations	60
UEPOPS450	Coordinate workplace communication ∟UEPOPS338 Facilitate workplace communication	40
UEPOPS451	Coordinate the use of contingency plans ∟UEPOPS370 Facilitate the use of contingency plans for power generation facilities	40
UEPOPS452	Conduct operational checks and carry out corrective action on in-service electrical plant	40
UEPOPS454	Coordinate response to critical incidents ∟UEPOPS369 Respond to a critical incident	30
UEPOPS456	Perform switching to a switching program	30
UEPOPS457	Control electrical energy production	40

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Qualification Mapping Information

This qualification replaces and is equivalent to UEP40112 Certificate IV in ESI Generation - Systems Operations

Links

Companion Volume implementation guides are found in VETNet - https://vetnet.gov.au/Pages/TrainingDocs.aspx?q=1715b9fa-e7bd-441c-bb8d-cf22c9c825a8

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UEP40218 Certificate IV in ESI Generation - Operations

Modification History

Release 2. This is the second release of this qualification in the Electricity Supply Industry - Generation Sector Training Package. The following modification has been made:

- UEPOPS334 Operate and monitor a wind generator and UEPOPS210 Conduct first response within a workplace team deleted due to zero enrolment.

Release 1. This is the first release of this qualification in the UEP - Electricity Supply Industry - Generation Sector Training Package.

Qualification Description

Participants gaining this qualification will be able to perform operations functions in the electrical supply industry. Functions may include the remote operation of network equipment, the isolating of power generation plant and equipment for work, estimating costs and observing safe working practices. It may also include the supervision of others and the coordination of work activities.

No licensing, legislative or certification requirements apply to this qualification at the time of publication.

Entry Requirements

There are no entry requirements for this qualification.

Packaging Rules

A total 1280 weighting points comprising 540 core weighting points, plus 740 elective weighting points from the general elective units listed below.

Choose a total of 740 weighting points from the general elective unit list below of which between 0 and 220 weighting points can be taken from Group A. A total of 620 weighting points may be taken from Group B. Between 140 and 740 weighting points may be selected from Group C, at least 140 weighting points must be selected from Group C. You may select all your elective units from this group.

Up to 220 weighting points of the general elective units Group A, may be selected, with appropriate contextualisation, from any relevant nationally endorsed Training Package or accredited course, provided that selected units contribute to the vocational outcome of the qualification. Previously assigned weighting points are listed in UEP CVIG, if not listed weighting points will be 10 points unless directed from the ESI Generation Industry Reference Committee (IRC). The general elective units must contribute to the vocational outcomes of the qualification.

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Where imported units are selected, care must be taken to ensure that all prerequisite units specified are complied with.

Where a prerequisite unit is attached to a unit, it is identified by this symbol ∟.

Core units		**Weighting points**
UEENEEE117A	Implement and monitor energy sector OHS policies and procedures	20
UEENEEE101A	Apply Occupational, Health and Safety regulations, codes and practices in the workplace	20
UEPOPS202	Apply quality systems to work	20
UEPOPS252	Undertake local systems operations	30
UEPOPS301	Conduct single energy source isolation procedures for permit to work	40
UEPOPS337	Maintain quality systems within the team ∟UEPOPS202 Apply quality systems to work	20
UEPOPS342	Analyse single protection device operation	60
UEPOPS347	Operate and monitor supervisory, control and data acquisition systems	40
UEPOPS402	Conduct multiple energy source isolation procedures for permit to work ∟UEPOPS301 Conduct single energy source isolation procedures for permit to work.	40
UEPOPS403	Coordinate permit to work system ∟UEPOPS402 Conduct multiple energy source isolation procedures for permit to work	40
UEPOPS405	Operate and monitor A.C. electrical systems	30
UEPOPS406	Operate and monitor D.C. electrical systems	30
UEPOPS417	Monitor and implement environmental site plans and procedures	20
UEPOPS426	Interpret and analyse multi-operation protection devices ∟UEPOPS342 Analyse single protection device operation	40

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UEPOPS439	Plan and organise work	30
UEPOPS440	Coordinate team activities	30
UEPOPS454	Coordinate response to critical incidents ∟UEPOPS369 Respond to a critical incident	30

Group A elective units		**Weighting points**
BSBCUS401	Coordinate implementation of customer service strategies	40
BSBINM401	Implement workplace information system	40
BSBINN301	Promote innovation in a team environment	40
BSBLED401	Develop teams and individuals	40
BSBMGT402	Implement operational plan	40
BSBMGT403	Implement continuous improvement	40
BSBLDR402	Lead effective workplace relationships	50
BSBLDR403	Lead team effectiveness	50
BSBWOR404	Develop work priorities	40
TAEDEL301	Provide work skill instruction	40

Group B elective units		**Weighting points**
UEPOPS203	Operate and monitor communications system	20
UEPOPS309	Operate and monitor air conditioning plant and ventilation systems	20
UEPOPS310	Operate bulk coal handling plant	40
UEPOPS311	Operate fabric filter dust collection plant	20
UEPOPS312	Operate and monitor fuel supply	20
UEPOPS313	Operate and monitor boiler draught system	40

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UEPOPS314	Operate and monitor fuel firing plant (gas or oil)	40
UEPOPS315	Operate and monitor fuel firing plant (coal)	40
UEPOPS316	Operate and monitor boiler steam/water cycle	40
UEPOPS317	Operate and monitor fixed fire protection systems	30
UEPOPS318	Operate and monitor compressed gas systems	30
UEPOPS319	Operate and monitor gas production plant	30
UEPOPS320	Operate and monitor compressed air systems	30
UEPOPS321	Operate and monitor water treatment plant	30
UEPOPS322	Operate and monitor alkalinity reduction plant	30
UEPOPS323	Operate and monitor reverse osmosis plant	30
UEPOPS324	Operate and monitor brine concentrator plant	30
UEPOPS325	Operate and monitor water quality monitoring systems	30
UEPOPS326	Operate and monitor oil systems	30
UEPOPS327	Monitor and maintain civil assets	30
UEPOPS328	Undertake dam safety surveillance	30
UEPOPS329	Operate and monitor auxiliary steam systems	40
UEPOPS330	Operate and monitor heat exchangers and cooling systems	40
UEPOPS331	Operate and monitor water systems (condensate and feedwater)	40
UEPOPS332	Operate and monitor condenser and auxiliary cooling systems	40
UEPOPS333	Operate and monitor HRSG hot gas control system	40
UEPOPS335	Operate a hydro generator synchronous condenser pump	60

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	unit	
UEPOPS336	Manage, operate and monitor a gas turbine unit	60
UEPOPS338	Facilitate workplace communication	20
UEPOPS339	Operate and monitor a boiler unit	60
UEPOPS340	Operate and monitor a steam turbine	60
UEPOPS343	Operate hydroelectric generating plant and auxiliary equipment	60
UEPOPS344	Conduct water conveyance and control	30
UEPOPS345	Implement dam safety surveillance procedures	30
UEPOPS346	Conduct non-routine operational testing	60
UEPOPS349	Operate local H.V. switchgear	40
UEPOPS351	Operate H.V. condition changing apparatus	60
UEPOPS352	Conduct operational checks on in-service mechanical plant	40
UEPOPS354	Operate and monitor dual fuel firing plant	80
UEPOPS355	Monitor the implementation of under frequency load shedding	60
UEPOPS356	Apply environmental and sustainable energy procedures	20
UEPOPS357	Operate local L.V. switchgear	40
UEPOPS358	Monitor and maintain wind farm civil assets	40
UEPOPS359	Monitor climatic conditions for renewable energy production	40
UEPOPS360	Operate and monitor a hydro turbine	60
UEPOPS361	Operate and monitor hydro plant auxiliary systems	60

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UEPOPS362	Operate and monitor generator/alternator	60
UEPOPS364	Ensure compliance with Work, Health and Safety policy and procedures	20
UEPOPS368	Operate manual systems ∟UEPOPS252 Undertake local systems operations	30
UEPOPS370	Facilitate the use of contingency plans for power generation facilities	60
UEPOPS371	Carry out operational checks on in-service electrical plant	40

Group C elective units		**Weighting points**
UEPOPS404	Coordinate first response team operation	20
UEPOPS407	Start and run up gas turbine	60
UEPOPS408	Shut down a gas turbine	60
UEPOPS409	Start up a boiler unit	60
UEPOPS410	Shut down a boiler unit	60
UEPOPS411	Run up a steam turbine	60
UEPOPS412	Undertake commissioning and decommissioning	30
UEPOPS413	Coordinate operational strategies for power production	20
UEPOPS414	Perform risk analysis of generation plant	20
UEPOPS416	Monitor implementation of quality control for production and maintenance ∟UEPOPS337 Maintain quality systems within the team	20
UEPOPS419	Shut down a steam turbine	60
UEPOPS420	Coordinate network/system	40
UEPOPS422	Schedule generation	40

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UEPOPS423	Plan a scheduled outage	40
UEPOPS424	Coordinate local H.V. networks	40
UEPOPS425	Produce maintenance plans for generation production plant	40
UEPOPS428	Develop H.V. switching programs	40
UEPOPS430	Control permit to work operations	30
UEPOPS431	Collect and analyse hydrological and meteorological data	20
UEPOPS432	Start up a heat recovery steam generator unit ∟UEPOPS333 Operate and monitor HRSG hot gas control system	30
UEPOPS433	Operate and monitor a heat recovery steam generator unit ∟UEPOPS333 Operate and monitor HRSG hot gas control system ∟UEPOPS407 Start and run up gas turbine ∟UEPOPS432 Start up a heat recovery steam generator unit	20
UEPOPS434	Shut down a heat recovery steam generator unit ∟UEPOPS333 Operate and monitor HRSG hot gas control system ∟UEPOPS408 Shut down a gas turbine	30
UEPOPS435	Operate and monitor flue gas (NOx) mitigation systems	30
UEPOPS437	Manage system restart	40
UEPOPS441	Operate and monitor system equipment	30
UEPOPS442	Monitor and coordinate the operation of a combined cycle gas turbine unit ∟UEPOPS314 Operate and monitor fuel firing plant (gas or oil) ∟UEPOPS333 Operate and monitor HRSG hot gas control system	60

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	∟UEPOPS336 Operate and monitor gas turbine unit ∟UEPOPS340 Operate and monitor a steam turbine	
UEPOPS443	Coordinate wind farm operations	40
UEPOPS444	Start and run up a hydro turbine	60
UEPOPS445	Shut down a hydro turbine	60
UEPOPS446	Operate and monitor hydro unit control and protection systems	80
UEPOPS447	Coordinate photovoltaic solar power plant operations	60
UEPOPS450	Coordinate workplace communication ∟UEPOPS338 Facilitate workplace communication	40
UEPOPS451	Coordinate the use of contingency plans ∟UEPOPS370 Facilitate the use of contingency plans for power generation facilities	40
UEPOPS452	Conduct operational checks and carry out corrective action on in-service electrical plant	40
UEPOPS456	Perform switching to a switching program	30
UEPOPS457	Control electrical energy production	40
UEPOPL001	Licence to operate a steam turbine	60
UEPOPL002	Licence to operate a reciprocating steam engine	60

Qualification Mapping Information

This qualification replaces and is equivalent to UEP40212 Certificate IV in ESI Generation - Operations

Links

Companion Volume implementation guides are found in VETNet - https://vetnet.gov.au/Pages/TrainingDocs.aspx?q=1715b9fa-e7bd-441c-bb8d-cf22c9c825a8

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UEP40318 Certificate IV in ESI Generation Maintenance - Electrical Electronics

Modification History

Release 2. This is the second release of this qualification in the Electricity Supply Industry - Generation Sector Training Package. The following modification has been made:

• UEPMNT415 Diagnose and repair faults in complex refrigeration and air conditioning equipment and UEPMNT434 Diagnose and repair faults in wind turbine control systems and UEPMNT345 Install electronic equipment and UEPMNT319 Maintain and test fixed fire protection systems and UEPMNT426 Maintain electronic instrumentation equipment and UEPMNT362 Maintain wind turbine control systems and UEPMNT413 Modify electronic electrical equipment and UEPMNT429 Modify electronic instrumentation equipment and UEPMNT424 Monitor efficiency of thermal steam cycle power plant and UEPMNT416 Overhaul electrical generator and UEPMNT352 Test and commission electronic electrical equipment and UEPMNT431 Test and commission electronic instrumentation equipment and UEPMNT441 Test and commission power plant inverter systems and UEPMNT436 Test and commission wind turbine control systems and UEPMNT432 Write programs for control systems deleted due to zero enrolment.

Release 1. This is the first release of this qualification in the UEP - Electricity Supply Industry - Generation Sector Training Package.

Qualification Description

Participants gaining this qualification will be able to manufacture, fit, assemble, erect, operate, test, find and diagnose faults and alter and repair electrical and electronic equipment including instrumentation systems. It does not include installation of any electrical wiring systems within an electrical installation as prescribed in current industry standards.

Functions can include maintenance planning and scheduling as well as electrical wiring work if it is associated with assembling, maintaining, terminating or altering the wiring between electrical components within power generating plant or machinery. It also includes the supervision of others and the coordination of work activities.

Electrical equipment means any appliance, article, accessory, wire, fitting, cable, conduit or apparatus that generates, uses, conveys or controls, or that is intended to generate, use, convey or control, electricity above extra low voltage.

No licensing, legislative or certification requirements apply to this qualification at the time of publication.

Entry Requirements

There are no entry requirements for this qualification.

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Packaging Rules

A total 1280 weighting points comprising 820 core weighting points, plus 460 elective weighting points from the general elective units listed below.

Choose a total of 460 weighting points from the elective units list below of which between 0 and 220 weighting points can be taken from Group A. A total of 220 weighting points can be selected from Group B. Between 240 and 460 weighting points may be taken from Group C, you may select all your elective units from this group.

Up to 220 weighting points of the general elective units Group A, may be selected, with appropriate contextualisation, from any relevant nationally endorsed Training Package or accredited course, provided that selected units contribute to the vocational outcome of the qualification. Previously assigned weighting points are listed in UEP CVIG, if not listed weighting points will be 10 points unless directed from the ESI Generation Industry Reference Committee (IRC). The general elective units must contribute to the vocational outcomes of the qualification.

Where imported units are selected, care must be taken to ensure that all prerequisite units specified are complied with.

Where a prerequisite unit is attached to a unit, it is identified by this symbol ∟.

Core units		**Weighting points**
UEENEEE101A	Apply Occupational Health and Safety regulations, codes and practices in the workplace	20
UEENEEE102A	Fabricate, assemble and dismantle, utilities industry components ∟UEENEEE101A Apply Occupational Health and Safety regulations, codes and practices in the workplace	40
UEENEEE104A	Solve problems in D.C. circuits ∟UEENEEE101A Apply Occupational Health and Safety regulations, codes and practices in the workplace	80
UEENEEE105A	Fix and secure electrotechnology equipment ∟UEENEEE101A Apply Occupational Health and Safety regulations, codes and practices in the workplace	20
UEENEEE107A	Use drawings, diagrams, schedules, standards, codes and specifications ∟UEENEEE101A Apply Occupational Health and Safety regulations, codes and practices in the workplace	40
UEENEEE117A	Implement and monitor energy sector OHS policies and procedures	20

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UEENEEE137A	Document and apply measures to control OHS risks associated with electrotechnology work	20
	∟UEENEEE101A Apply Occupational Health and Safety regulations, codes and practices in the workplace	
UEENEEG006A	Solve problems in single and three phase low voltage machines	80
	∟UEENEEE101A Apply Occupational Health and Safety regulations, codes and practices in the workplace	
	∟UEENEEE102A Fabricate, dismantle, assemble of electrotechnology components	
	∟UEENEEE104A Solve problems in D.C circuits	
	∟UEENEEE105A Fix and secure electrotechnology equipment	
	∟UEENEEE107A Use drawings, diagrams, schedules, standards, codes and specifications	
	∟UEENEEG101A Solve problems in electromagnetic devices and related circuits	
	∟UEENEEG102A Solve problems in low voltage A.C. circuit	
	∟UEENEEG106A Terminate cables, cords and accessories for low voltage circuits	
UEENEEG033A	Solve problems in single and three phase low voltage electrical apparatus and circuits	60
	∟UEENEEE101A Apply Occupational Health and Safety regulations, codes and practices in the workplace	
	∟UEENEEE102A Fabricate, dismantle, assemble of electrotechnology components	
	∟UEENEEE104A Solve problems in D.C circuits	
	∟UEENEEE105A Fix and secure electrotechnology equipment	
	∟UEENEEE107A Use drawings, diagrams, schedules, standards, codes and specifications	
	∟UEENEEG101A Solve problems in electromagnetic devices and related circuits	
	∟UEENEEG102A Solve problems in low voltage A.C. circuit	
	∟UEENEEG106A Terminate cables, cords and accessories for low voltage circuits	

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UEENEEG063A	Arrange circuits, control and protection for general electrical installations	40
	∟UEENEEE101A Apply Occupational Health and Safety regulations, codes and practices in the workplace	
	∟UEENEEE102A Fabricate, dismantle, assemble of electrotechnology components	
	∟UEENEEE104A Solve problems in D.C circuits	
	∟UEENEEE105A Fix and secure electrotechnology equipment	
	∟UEENEEE107A Use drawings, diagrams, schedules, standards, codes and specifications	
	∟UEENEEG101A Solve problems in electromagnetic devices and related circuits	
	∟UEENEEG102A Solve problems in low voltage A.C. circuit	
	∟UEENEEG106A Terminate cables, cords and accessories for low voltage circuits	
UEENEEG101A	Solve problems in electromagnetic devices and related circuits	60
	∟UEENEEE101A Apply Occupational Health and Safety regulations, codes and practices in the workplace	
	∟UEENEEE104A Solve problems in D.C circuits	
UEENEEG102A	Solve problems in low voltage A.C circuits	80
	∟UEENEEE101A Apply Occupational Health and Safety regulations, codes and practices in the workplace	
	∟UEENEEE104A Solve problems in D.C circuits	
	∟UEENEEG101A Solve problems in electromagnetic devices and related circuits	
UEENEEG106A	Terminate cables, cords and accessories for low voltage circuits	40
	∟UEENEEE101A Apply Occupational Health and Safety regulations, codes and practices in the workplace	
	∟UEENEEE102A Fabricate, assemble and dismantle utilities industry components	
	∟UEENEEE105A Fix and secure electrotechnology equipment	
	∟UEENEEE107A Use drawings, diagrams, schedules,	

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	standards, codes and specifications	
UEENEEG108A	Troubleshoot and repair faults in low voltage electrical apparatus and circuits	40
	∟UEENEEE101A Apply Occupational Health and Safety regulations, codes and practices in the workplace	
	∟UEENEEE102A Fabricate, dismantle, assemble of utilities components	
	∟UEENEEE104A Solve problems in D.C. circuits	
	∟UEENEEE105A Fix and secure electrotechnology equipment	
	∟UEENEEE107A Use drawings, diagrams, schedules, standards, codes and specifications	
	∟UEENEEG006A Solve problems in single and three phase low voltage machines	
	∟UEENEEG033A Solve problems in single and three phase electrical apparatus and circuits	
	∟UEENEEG063A Arrange circuits, control and protection for general electrical installations	
	∟UEENEEG101A Solve problems in electromagnetic devices and related circuits	
	∟UEENEEG102A Solve problems in low voltage A.C. circuits	
	∟UEENEEG106A Terminate cables, cords and accessories for low voltage circuits	
UEENEEG109A	Develop and connect electrical control circuits	80
	∟UEENEEE101A Apply Occupational Health and Safety regulations, codes and practices in the workplace	
	∟UEENEEE102A Fabricate, dismantle, assemble of electrotechnology components	
	∟UEENEEE104A Solve problems in D.C circuits	
	∟UEENEEE105A Fix and secure electrotechnology equipment	
	∟UEENEEE107A Use drawings, diagrams, schedules, standards, codes and specifications	
	∟UEENEEG006A Solve problems in single and three phase low voltage machines	
	∟UEENEEG063A Arrange circuits, control and	

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	protection for general electrical installations ∟UEENEEG101A Solve problems in electromagnetic devices and related circuits ∟UEENEEG102A Solve problems in low voltage A.C. circuit ∟UEENEEG106A Terminate cables, cords and accessories for low voltage circuit	
UEPOPS338	Facilitate workplace communication	20
UEPOPS371	Carry out operational checks on in-service electrical plant	40
UEPOPS417	Monitor and implement environmental site plans and procedures	20
UEPOPS430	Control permit to work operations	20

Group A elective units		**Weighting points**
UEENEEC001B	Maintain documentation	20
BSBCUS201	Deliver a service to customers	20
UEENEED101A	Use computer applications relevant to a workplace ∟UEENEEE101A Apply Work, Health Safety regulations, codes and practices in the workplace.	20
UEENEED104A	Use engineering applications software on personal computers ∟UEENEEE101A Apply Work, Health Safety regulations, codes and practices in the workplace	40
UEENEEE124A	Compile and produce an energy sector detailed report	60
BSBCUS401	Coordinate implementation of customer service strategies	40
BSBINM401	Implement workplace information system	40
BSBINN301	Promote innovation in a team environment	40
BSBLED401	Develop teams and individuals	40

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BSBMGT402	Implement operational plan	40
BSBMGT403	Implement continuous improvement	40
BSBLDR402	Lead effective workplace relationships	50
BSBLDR403	Lead team effectiveness	50
BSBWOR404	Develop work priorities	40
TAEDEL301	Provide work skill instruction	40

Group B elective units		**Weighting points**
UEENEEF102A	Install and maintain cabling for multiple access to telecommunication services ∟UEENEEE101A Apply Occupational Health and Safety regulations, codes and practices in the workplace ∟UEENEEE102A Fabricate, assemble and dismantle utilities industry components ∟UEENEEE104A Solve problems in D.C. circuits ∟UEENEEE105A Fix and secure electrotechnology equipment ∟UEENEEE107A Use drawings, diagrams, schedules, standards, codes and specifications	120
UEENEEF105A	Install and modify optical fibre performance data communication cabling ∟UEENEEE101A Apply Occupational Health and Safety regulations, codes and practices in the workplace ∟UEENEEE102A Fabricate, assemble and dismantle utilities industry components ∟UEENEEE104A Solve problems in D.C. circuits ∟UEENEEE105A Fix and secure electrotechnology equipment ∟UEENEEE107A Use drawings, diagrams, schedules, standards, codes and specifications ∟UEENEEF102A Install and maintain cabling for multiple access to telecommunication services	40
UEENEEI101A	Use instrumentation drawings, specifications, standards	40

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	and equipment manuals	
	∟UEENEEE101A Apply Work, Health Safety regulations, codes and practices in the workplace`	
	∟UEENEEE107A Use drawings, diagrams, schedules, standards, codes and specifications	
UEENEEI107A	Install instrumentation and control cabling and tubing	20
	∟UEENEEE101A Apply Occupational Health and Safety regulations, codes and practices in the workplace	
	∟UEENEEE107A Use drawings, diagrams, schedules, standards, codes and specifications	
	∟UEENEEI101A Use instrumentation drawings, specification, standards and equipment manuals	
UEENEEI108A	Install instrumentation and control apparatus and associated equipment	20
	∟UEENEEE101A Apply Work, Health Safety regulations, codes and practices in the workplace`	
	∟UEENEEE107A Use drawings, diagrams, schedules, standards, codes and specifications	
	∟UEENEEI101A Use instrumentation drawings, specification, standards and equipment manuals	
UEPMNT346	Maintain electrical equipment	40
	∟UEENEEG108A Trouble shoot and repair faults in low voltage electrical apparatus and circuits	
	∟UEENEEE102A Fabricate, dismantle, assemble of utilities industry components	
	∟UEENEEE105A Fix and secure electrotechnology equipment	
	∟UEENEEE107A Use drawings, diagrams, schedules, standards, cords and specifications	
	∟UEENEEG006A Solve problems in single and three phase low voltage machines	
	∟UEENEEG033A Solve problems in single and three phase low voltage electrical apparatus and circuits	
	∟UEENEEG063A Arrange circuits, control and protection for general electrical installations	
	∟UEENEEG101A Solve problems in electromagnetic devices and related circuits	
	∟UEENEEG102A Solve problems in low voltage A.C.	

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	circuits	
	∟UEENEEG106A Terminate cables, cords and accessories for low voltage circuits	
UEPMNT347	Maintain complex electrical equipment	60
	∟UEPMNT346 Maintain electrical equipment	
UEPMNT348	Maintain electrical electronic equipment	40
	∟UEENEEG108A Troubleshoot and repair faults in low voltage electrical apparatus and circuits	
	∟UEENEEE107A Use drawings, diagrams, schedules, standards, cords and specifications	
	∟UEENEEG006A Solve problems in single and three phase low voltage machines	
	∟UEENEEG033A Solve problems in single and three phase low voltage electrical apparatus and circuits	
	∟UEENEEG063A Arrange circuits, control and protection for general electrical installations	
	∟UEENEEG101A Solve problems in electromagnetic devices and related circuits	
	∟UEENEEG102A Solve problems in low voltage A.C. circuits	
	∟UEENEEG106A Terminate cables, cords and accessories for low voltage circuits	
UEPMNT350	Modify electrical equipment	40
	∟UEENEEG108A Troubleshoot and repair faults in low voltage electrical apparatus and circuits	
	∟UEENEEE107A Use drawings, diagrams, schedules, standards, cords and specifications	
	∟UEENEEG006A Solve problems in single and three phase low voltage machines	
	∟UEENEEG033A Solve problems in single and three phase low voltage electrical apparatus and circuits	
	∟UEENEEG063A Arrange circuits, control and protection for general electrical installations	
	∟UEENEEG101A Solve problems in electromagnetic devices and related circuits	
	∟UEENEEG102A Solve problems in low voltage A.C. circuits	
	∟UEENEEG106A Terminate cables, cords and	

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	accessories for low voltage circuits	
UEPMNT351	Test and commission electrical equipment	40
	∟UEENEEG108A Troubleshoot and repair faults in low voltage electrical apparatus and circuits	
	∟UEENEEE102A Fabricate, dismantle, assemble of utilities industry components	
	∟UEENEEE104A Solve problems in D.C. circuits	
	∟UEENEEE105A Fix and secure electrotechnology equipment	
	∟UEENEEE107A Use drawings, diagrams, schedules, standards, cords and specifications	
	∟UEENEEG006A Solve problems in single and three phase low voltage machines	
	∟UEENEEG033A Solve problems in single and three phase low voltage electrical apparatus and circuits	
	∟UEENEEG063A Arrange circuits, control and protection for general electrical installations	
	∟UEENEEG101A Solve problems in electromagnetic devices and related circuits	
	∟UEENEEG102A Solve problems in low voltage A.C. circuits	
	∟UEENEEG106A Terminate cables, cords and accessories for low voltage circuits	
UEPMNT355	Install complex electronic instrumentation equipment	40
	∟UEENEEI108A Install instrumentation and control apparatus and associated equipment	
	∟UEENEEE102A Fabricate, dismantle, assemble of utilities industry components	
	∟UEENEEE105A Fix and secure electrotechnology equipment	
	∟UEENEEE107A Use drawings, diagrams, schedules, standards, cords and specifications	
UEPMNT356	Maintain instrumentation equipment	40
	∟UEENEEE102A Fabricate, dismantle, assemble of utilities industry components	
	∟UEENEEE105A Fix and secure electrotechnology equipment	

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	∟UEENEEE107A Use drawings, diagrams, schedules, standards, cords and specifications	
UEPMNT357	Diagnose and repair faults in instrumentation equipment	60
	∟UEENEEE102A Fabricate, dismantle, assemble of utilities industry components	
	∟UEENEEE105A Fix and secure electrotechnology equipment	
	∟UEENEEE107A Use drawings, diagrams, schedules, standards, cords and specifications	
UEPMNT358	Modify instrumentation equipment	40
	∟UEENEEE102A Fabricate, dismantle, assemble of utilities industry components	
	∟UEENEEE105A Fix and secure electrotechnology equipment	
	∟UEENEEE107A Use drawings, diagrams, schedules, standards, cords and specifications	
UEPMNT359	Test and commission instrumentation equipment	40
	∟UEENEEE102A Fabricate, dismantle, assemble of utilities industry components	
	∟UEENEEE105A Fix and secure electrotechnology equipment	
	∟UEENEEE107A Use drawings, diagrams, schedules, standards, cords and specifications	
UEPMNT366	Maintain power plant inverter systems	60
	∟UEENEEG108A Troubleshoot and repair faults in low voltage electrical apparatus and circuits	
	∟UEENEEE102A Fabricate, dismantle, assemble of utilities industry components	
	∟UEENEEE104A Solve problems in D.C. circuits	
	∟UEENEEE105A Fix and secure electrotechnology equipment	
	∟UEENEEE107A Use drawings, diagrams, schedules, standards, cords and specifications	
	∟UEENEEG006A Solve problems in single and three phase low voltage machines	
	∟UEENEEG033A Solve problems in single and three phase low voltage electrical apparatus and circuits	

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	∟UEENEEG063A Arrange circuits, control and protection for general electrical installations	
	∟UEENEEG101A Solve problems in electromagnetic devices and related circuits	
	∟UEENEEG102A Solve problems in low voltage A.C. circuits	
	∟UEENEEG106A Terminate cables, cords and accessories for low voltage circuits	
UEPOPS202	Apply quality systems to work	20
UEPOPS301	Conduct single energy source isolation procedures for permit to work	40
UEPOPS337	Maintain quality systems within the team	20
	∟UEPOPS202 Apply quality systems to work	

Group C elective units		**Weighting points**
UEENEEC005B	Estimate electrotechnology projects	40
UEPMNT410	Diagnose and repair faults in electronic equipment	60
	∟UEENEEG108A Troubleshoot and repair faults in low voltage electrical apparatus and circuits	
	∟UEENEEE102A Fabricate, dismantle, assemble of utilities industry components	
	∟UEENEEE104A Solve problems in D.C. circuits	
	∟UEENEEE105A Fix and secure electrotechnology equipment	
	∟UEENEEE107A Use drawings, diagrams, schedules, standards, cords and specifications	
	∟UEENEEG006A Solve problems in single and three phase low voltage machines	
	∟UEENEEG033A Solve problems in single and three phase low voltage electrical apparatus and circuits	
	∟UEENEEG063A Arrange circuits, control and protection for general electrical installations	
	∟UEENEEG101A Solve problems in electromagnetic devices and related circuits	
	∟UEENEEG102A Solve problems in low voltage A.C. circuits	

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	∟UEENEEG106A Terminate cables, cords and accessories for low voltage circuits	
UEPMNT411	Diagnose and repair faults in complex electrical equipment	60
	∟UEENEEG108A Troubleshoot and repair faults in low voltage electrical apparatus and circuits	
	∟UEENEEE102A Fabricate, dismantle, assemble of utilities industry components	
	∟UEENEEE104A Solve problems in D.C. circuits	
	∟UEENEEE105A Fix and secure electrotechnology equipment	
	∟UEENEEE107A Use drawings, diagrams, schedules, standards, cords and specifications	
	∟UEENEEG006A Solve problems in single and three phase low voltage machines	
	∟UEENEEG033A Solve problems in single and three phase low voltage electrical apparatus and circuits	
	∟UEENEEG063A Arrange circuits, control and protection for general electrical installations	
	∟UEENEEG101A Solve problems in electromagnetic devices and related circuits	
	∟UEENEEG102A Solve problems in low voltage A.C. circuits	
	∟UEENEEG106A Terminate cables, cords and accessories for low voltage circuit	
UEPMNT412	Modify complex electrical equipment	60
	∟UEPMNT350 Modify electrical equipment	
	∟UEENEEG108A Troubleshoot and repair faults in low voltage electrical apparatus and circuits	
	∟UEENEEE102A Fabricate, dismantle, assemble of utilities industry components	
	∟UEENEEE104A Solve problems in D.C. circuits	
	∟UEENEEE105A Fix and secure electrotechnology equipment	
	∟UEENEEE107A Use drawings, diagrams, schedules, standards, cords and specifications	
	∟UEENEEG006A Solve problems in single and three phase low voltage machines	

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	∟UEENEEG033A Solve problems in single and three phase low voltage electrical apparatus and circuits	
	∟UEENEEG063A Arrange circuits, control and protection for general electrical installations	
	∟UEENEEG101A Solve problems in electromagnetic devices and related circuits	
	∟UEENEEG102A Solve problems in low voltage A.C. circuits	
	∟UEENEEG106A Terminate cables, cords and accessories for low voltage circuits	
UEPMNT414	Test and commission complex electrical equipment	60
	∟UEPMNT351 Test and commission electrical equipment	
	∟UEENEEG108A Troubleshoot and repair faults in low voltage electrical apparatus and circuits	
	∟UEENEEE102A Fabricate, dismantle, assemble of utilities industry components	
	∟UEENEEE104A Solve problems in D.C. circuits	
	∟UEENEEE105A Fix and secure electrotechnology equipment	
	∟UEENEEE107A Use drawings, diagrams, schedules, standards, cords and specifications	
	∟UEENEEG006A Solve problems in single and three phase low voltage machines	
	∟UEENEEG033A Solve problems in single and three phase low voltage electrical apparatus and circuits	
	∟UEENEEG063A Arrange circuits, control and protection for general electrical installations	
	∟UEENEEG101A Solve problems in electromagnetic devices and related circuits	
	∟UEENEEG102A Solve problems in low voltage A.C. circuits	
	∟UEENEEG106A Terminate cables, cords and accessories for low voltage circuits	
UEPMNT417	Inspect electrical generators and diagnose faults	80
	∟UEPMNT351 Test and commission electrical equipment	
	∟UEENEEG108A Troubleshoot and repair faults in low	

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	voltage electrical apparatus and circuits ∟UEENEEE102A Fabricate, dismantle, assemble of utilities industry components ∟UEENEEE104A Solve problems in D.C. circuits ∟UEENEEE105A Fix and secure electrotechnology equipment ∟UEENEEE107A Use drawings, diagrams, schedules, standards, cords and specifications ∟UEENEEG006A Solve problems in single and three phase low voltage machines ∟UEENEEG033A Solve problems in single and three phase low voltage electrical apparatus and circuits ∟UEENEEG063A Arrange circuits, control and protection for general electrical installations ∟UEENEEG101A Solve problems in electromagnetic devices and related circuits ∟UEENEEG102A Solve problems in low voltage A.C. circuits ∟UEENEEG106A Terminate cables, cords and accessories for low voltage circuit	
UEPMNT421	Conduct technical inspection of process plant and equipment ∟UEPMNT351 Test and commission electrical equipment ∟UEENEEG108A Troubleshoot and repair faults in low voltage electrical apparatus and circuits ∟UEENEEE102A Fabricate, dismantle, assemble of utilities industry components ∟UEENEEE104A Solve problems in D.C. circuits ∟UEENEEE105A Fix and secure electrotechnology equipment ∟UEENEEE107A Use drawings, diagrams, schedules, standards, cords and specifications ∟UEENEEG006A Solve problems in single and three phase low voltage machines ∟UEENEEG033A Solve problems in single and three phase low voltage electrical apparatus and circuits ∟UEENEEG063A Arrange circuits, control and protection for general electrical installations	60

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	∟UEENEEG101A Solve problems in electromagnetic devices and related circuits	
	∟UEENEEG102A Solve problems in low voltage A.C. circuits	
	∟UEENEEG106A Terminate cables, cords and accessories for low voltage circuits	
UEPMNT422	Conduct performance testing on process plant and equipment	60
	∟UEPMNT351 Test and commission electrical equipment	
	∟UEENEEG108A Troubleshoot and repair faults in low voltage electrical apparatus and circuits	
	∟UEENEEE102A Fabricate, dismantle, assemble of utilities industry components	
	∟UEENEEE104A Solve problems in D.C. circuits	
	∟UEENEEE105A Fix and secure electrotechnology equipment	
	∟UEENEEE107A Use drawings, diagrams, schedules, standards, cords and specifications	
	∟UEENEEG006A Solve problems in single and three phase low voltage machines	
	∟UEENEEG033A Solve problems in single and three phase low voltage electrical apparatus and circuits	
	∟UEENEEG063A Arrange circuits, control and protection for general electrical installations	
	∟UEENEEG101A Solve problems in electromagnetic devices and related circuits	
	∟UEENEEG102A Solve problems in low voltage A.C. circuits	
	∟UEENEEG106A Terminate cables, cords and accessories for low voltage circuit	
UEPMNT425	Maintain complex instrumentation equipment	80
	∟UEPMNT356 Maintain instrumentation equipment	
	∟UEENEEE102A Fabricate, dismantle, assemble of utilities industry components	
	∟UEENEEE105A Fix and secure electrotechnology equipment	
	∟UEENEEE107A Use drawings, diagrams, schedules,	

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	standards, cords and specifications	
UEPMNT427	Diagnose and repair faults in complex instrumentation equipment ∟UEPMNT356 Maintain instrumentation equipment ∟UEENEEE102A Fabricate, dismantle, assemble of utilities industry components ∟UEENEEE105A Fix and secure electrotechnology equipment ∟UEENEEE107A Use drawings, diagrams, schedules, standards, cords and specifications	80
UEPMNT428	Modify complex instrumentation equipment ∟UEPMNT356 Maintain instrumentation equipment ∟UEENEEE102A Fabricate, dismantle, assemble of utilities industry components ∟UEENEEE105A Fix and secure electrotechnology equipment ∟UEENEEE107A Use drawings, diagrams, schedules, standards, cords and specifications	80
UEPMNT430	Test and commission complex instrumentation equipment ∟UEPMNT359 Test and commission instrumentation equipment ∟UEENEEE102A Fabricate, dismantle, assemble of utilities industry components ∟UEENEEE105A Fix and secure electrotechnology equipment ∟UEENEEE107A Use drawings, diagrams, schedules, standards, cords and specifications	80
UEPMNT433	Conduct routine generator electrical maintenance ∟UEPMNT346 Maintain electrical equipment ∟UEENEEG108A Troubleshoot and repair faults in low voltage electrical apparatus and circuits ∟UEENEEE102A Fabricate, dismantle, assemble of utilities industry components ∟UEENEEE104A Solve problems in D.C. circuits ∟UEENEEE105A Fix and secure electrotechnology	60

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	equipment	
	∟UEENEEE107A Use drawings, diagrams, schedules, standards, cords and specifications	
	∟UEENEEG006A Solve problems in single and three phase low voltage machines	
	∟UEENEEG033A Solve problems in single and three phase low voltage electrical apparatus and circuits	
	∟UEENEEG063A Arrange circuits, control and protection for general electrical installations	
	∟UEENEEG101A Solve problems in electromagnetic devices and related circuits	
	∟UEENEEG102A Solve problems in low voltage A.C. circuits	
	∟UEENEEG106A Terminate cables, cords and accessories for low voltage circuits	
UEPMNT440	Diagnose and repair faults in power plant inverter systems	60
	∟UEPMNT366 Maintain power plant inverter systems	
	∟UEENEEG108A Troubleshoot and repair faults in low voltage electrical apparatus and circuits	
	∟UEENEEE102A Fabricate, dismantle, assemble of utilities industry components	
	∟UEENEEE104A Solve problems in D.C. circuits	
	∟UEENEEE105A Fix and secure electrotechnology equipment	
	∟UEENEEE107A Use drawings, diagrams, schedules, standards, cords and specifications	
	∟UEENEEG006A Solve problems in single and three phase low voltage machines	
	∟UEENEEG033A Solve problems in single and three phase low voltage electrical apparatus and circuits	
	∟UEENEEG063A Arrange circuits, control and protection for general electrical installations	
	∟UEENEEG101A Solve problems in electromagnetic devices and related circuits	
	∟UEENEEG102A Solve problems in low voltage A.C. circuits	
	∟UEENEEG106A Terminate cables, cords and accessories for low voltage circuits	

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UEPOPS402	Conduct multiple energy source isolation procedures for permit to work ∟UEPOPS301 Conduct single energy source isolation procedures for permit to work.	40
UEPOPS439	Plan and organise work	30

Qualification Mapping Information

This qualification replaces and is equivalent to UEP40512 Certificate IV in ESI Generation Maintenance - Electrical Electronics

Links

Companion Volume implementation guides are found in VETNet - https://vetnet.gov.au/Pages/TrainingDocs.aspx?q=1715b9fa-e7bd-441c-bb8d-cf22c9c825a8

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UEP40418 Certificate IV in ESI Generation Maintenance (Fabrication)

Modification History

Release 2. This is the second release of this qualification in the Electricity Supply Industry - Generation Sector Training Package. The following modification has been made:

- UEPMNT339 Perform sheet metal work and UEPMNT424 Monitor efficiency of thermal steam cycle power plant deleted due to zero enrolment.

Release 1. This is the first release of this qualification in the UEP - Electricity Supply Industry - Generation Sector Training Package.

Qualification Description

Participants gaining this qualification will be able to complete power generation work functions in the electrical supply industry. Functions can include installation, fabrication, repair and maintenance of industrial pressure vessels and associated pipe work, coded welding, welding supervision, general fabrication and the observation of safe working practices. It also includes the supervision of others and the coordination of work activities.

No licensing, legislative or certification requirements apply to this qualification at the time of publication.

Entry Requirements

There are no entry requirements for this qualification.

Packaging Rules

A total 1280 weighting points comprising 760 core weighting points, plus 520 elective weighting points from the general elective units listed below.

Choose a total of 520 weighting point from the general elective units list below of which between 0 and 220 weighting points can be taken from Group A. A total of 410 weighting points can be selected from Group B. Between 120 and 520 weighting points may be taken from Group C, you may select all your elective units from this group.

Up to 220 weighting points of the general elective units Group A, may be selected, with appropriate contextualisation, from any relevant nationally endorsed Training Package or accredited course, provided that selected units contribute to the vocational outcome of the qualification. Previously assigned weighting points are listed in UEP CVIG, if not listed weighting points will be 10 points unless directed from the ESI Generation Industry Reference Committee (IRC). The general elective units must contribute to the vocational outcomes of the qualification.

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Where imported units are selected, care must be taken to ensure that all prerequisite units specified are complied with.

Where a prerequisite unit is attached to a unit, it is identified by this symbol ∟.

Core units		**Weighting points**
MEM05007C	Perform manual heating and thermal cutting	20
MEM05012C	Perform routine manual metal arc welding	20
MEM05015D	Weld using manual metal arc welding process ∟MEM05012C Perform routine manual metal arc welding ∟MEM05051A Select welding processes ∟MEM05052A Apply safe welding practices ∟MEM12023A Perform engineering measurements ∟MEM18001C Use hand tools ∟MEM18002B Use power tools/hand held operations	40
MEM05016C	Perform advanced welding using manual metal arc welding process ∟MEM05007C Perform manual heating and thermal cutting ∟MEM05012C Perform routine manual metal arc welding ∟MEM05015D Weld using manual metal arc welding process ∟MEM05051A Select welding processes ∟MEM05052A Apply safe welding practices ∟MEM09002B Interpret technical drawing ∟MEM12023A Perform engineering measurements ∟MEM18001C Use hand tools ∟MEM18002B Use power tools/hand held operation	40
MEM05017D	Weld using gas metal arc welding process ∟MEM05050B Perform routine gas metal arc welding ∟MEM05051A Select welding processes ∟MEM05052A Apply safe welding practices ∟MEM12023A Perform engineering measurements	40

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	∟MEM18001C Use hand tools	
	∟MEM18002B Use power tools/hand held operations	
MEM05018C	Perform advanced welding using gas metal arc welding process	40
	∟MEM05007C Perform manual heating and thermal cutting	
	∟MEM05017D Weld using gas metal arc welding process	
	∟MEM05050B Perform routine gas metal arc welding	
	∟MEM05051A Select welding processes	
	∟MEM05052A Apply safe welding practices	
	∟MEM09002B Interpret technical drawing	
	∟MEM12023A Perform engineering measurements	
	∟MEM18001C Use hand tools	
	∟MEM18002B Use power tools/hand held operations	
MEM05024B	Perform welding supervision	120
	∟MEM05026C Apply welding principles	
MEM05026C	Apply welding principles	40
MEM05050B	Perform routine gas metal arc welding	20
MEM05051A	Select welding processes	20
MEM05052A	Apply safe welding practices	40
MEM09002B	Interpret technical drawing	40
MEM12023A	Perform engineering measurements	50
MEM18001C	Use hand tools	20
MEM18002B	Use power tools/hand held operations	20
UEENEEE101A	Apply Occupational, Health and Safety regulations, codes and practices in the workplace	20
UEENEEE117A	Implement and monitor energy sector OHS policies and procedures	20

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UEPMNT302	Install and maintain industrial pipe work ∟MEM18006C Repair and fit engineering components ∟MEM09002B Interpret technical drawing ∟MEM12023A Perform Engineering Measurements ∟MEM18001C Use hand tools ∟MEM18002B Use power tools/hand held operations ∟MEM18003C Use tools for precision work ∟MEM18055B Dismantle, replace and assemble engineering components	40
UEPOPS202	Apply quality systems to work	20
UEPOPS337	Maintain quality systems within the team ∟UEPOPS202 Apply quality systems to work	20
UEPOPS417	Monitor and implement environmental site plans and procedures	20
UEPOPS430	Control permit to work operations	20
UEPOPS439	Plan and organise work	30

Group A elective units		**Weighting points**
BSBCUS401	Coordinate implementation of customer service strategies	40
BSBINM401	Implement workplace information system	40
BSBINN301	Promote innovation in a team environment	40
BSBLED401	Develop teams and individuals	40
BSBMGT402	Implement operational plan	40
BSBMGT403	Implement continuous improvement	40
BSBLDR402	Lead effective workplace relationships	50
BSBLDR403	Lead team effectiveness	50
BSBWOR404	Develop work priorities	40

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CPCCCM2007B	Use explosive power tools ∟CPCCOHS2001A Apply OHS requirements, policies and procedures in the construction industry	15
CPCCLDG3001A	Licence to perform dogging	30
CPCCLRG3001A	Licence to perform rigging basic level ∟CPCCLDG3001A Licence to perform dogging	40
CPCCLRG3002A	Licence to perform rigging intermediate level ∟CPCCLRG3001A Licence to perform rigging basic level	40
CPCCLSF2001A	Licence to erect, alter and dismantle scaffolding basic level	40
RIIHAN309E	Conduct telescopic materials handler operations	80
TAEDEL301	Provide work skill instruction	40
TLILIC0003	Licence to operate a forklift truck	40
TLILIC0002	Licence to operate a vehicle loading crane (capacity 10 metre tonnes and above)	40
TLILIC0005	Licence to operate a boom type elevating work platform (boom length 11 metres or more)	30

Group B elective units		**Weighting points**
UEPOPS338	Facilitate workplace communication	20
UEPMNT340	Fabricate metal structures and components ∟MEM18006C Repair and fit engineering components ∟MEM09002B Interpret technical drawing ∟MEM12023A Perform engineering measurements ∟MEM18001C Use hand tools ∟MEM18002B Use power tools/hand held operations ∟MEM18003C Use tools for precision work ∟MEM18055B Dismantle, replace and assemble engineering components	40

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MEM05004C	Perform routine oxy acetylene welding	20
MEM05005B	Carry out mechanical cutting	20
	∟MEM12023A Perform engineering measurements	
	∟MEM18001C Use hand tools	
MEM05011D	Assemble fabricated components	80
	∟MEM05005B Carry out mechanical cutting	
	∟MEM05007C Perform manual heating and thermal cutting	
	∟MEM05012C Perform routine manual metal arc welding	
	∟MEM05015D Weld using manual metal arc welding process	
	∟MEM05051A Select welding processes	
	∟MEM05052A Apply safe welding practices	
	∟MEM05019D Weld using gas tungsten arc welding process	
	∟MEM05049B Perform routine gas tungsten arc welding	
	∟MEM05004C Perform routine oxy acetylene welding	
	∟MEM05022C Perform advanced welding using oxy acetylene welding process	
	∟MEM05017D Weld using gas metal arc welding process	
	∟MEM05050B Perform routine gas metal arc welding	
	∟MEM09002B Interpret technical drawing	
	∟MEM12023A Perform engineering measurements	
	∟MEM18001C Use hand tools	
	∟MEM18002B Use power tools/hand held operations	
MEM05019D	Weld using gas tungsten arc welding process	40
	∟MEM05049B Perform routine gas tungsten arc welding	
	∟MEM05051A Select welding processes	
	∟MEM05052A Apply safe welding practices	
	∟MEM12023A Perform engineering measurements	

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	∟MEM18001C Use hand tools	
	∟MEM18002B Use power tools/hand held operations	
MEM05036C	Repair/replace/modify fabrications	40
	∟MEM05005B Carry out mechanical cutting	
	∟MEM05007C Perform manual heating and thermal cutting	
	∟MEM05011D Assemble fabricated components	
	∟MEM05012C Perform routine manual metal arc welding	
	∟MEM05015D Weld using manual metal arc welding process	
	∟MEM05051A Select welding processes	
	∟MEM05052A Apply safe welding practices	
	∟MEM09002B Interpret technical drawing	
	∟MEM12023A Perform engineering measurements	
	∟MEM18001C Use hand tools	
	∟MEM18002B Use power tools/hand held operations	
	∟MEM05017D Weld using gas metal arc welding process	
	∟MEM05050B Perform routine gas metal arc welding	
	∟MEM05004C Perform routine oxy acetylene welding	
	∟MEM05022C Perform advanced welding using oxy acetylene welding process	
	∟MEM05051A Select welding processes	
	∟MEM05019D Weld using gas tungsten arc welding process	
	∟MEM05049B Perform routine gas tungsten arc welding	
MEM05049B	Perform routine gas tungsten arc welding	20
MEM12007D	Mark off/out structural fabrications and shapes	40
	∟MEM12023A Perform engineering measurements	
MEM12024A	Perform computations	30
UEPOPS301	Conduct single energy source isolation procedures for permit to work	40

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Group C elective units		**Weighting points**
UEPMNT421	Conduct technical inspection of process plant and equipment ∟UEPMNT351 Test and commission electrical equipment ∟UEENEEG108A Troubleshoot and repair faults in low voltage electrical apparatus and circuits ∟UEENEEE102A Fabricate, assemble and dismantle utilities industry components ∟UEENEEE104A Solve problems in D.C. circuits ∟UEENEEE105A Fix and secure electrotechnology equipment ∟UEENEEE107A Use drawings, diagrams, schedules, standards, cords and specifications ∟UEENEEG006A Solve problems in single and three phase low voltage machines ∟UEENEEG033A Solve problems in single and three phase low voltage electrical apparatus and circuits ∟UEENEEG063A Arrange circuits, control and protection for general electrical installations ∟UEENEEG101A Solve problems in electromagnetic devices and related circuits ∟UEENEEG102A Solve problems in low voltage A.C. circuits ∟UEENEEG106A Terminate cables, cords and accessories for low voltage circuits	60
UEPMNT422	Conduct performance testing on process plant and equipment ∟UEPMNT351 Test and commission electrical equipment ∟UEENEEG108A Troubleshoot and repair faults in low voltage electrical apparatus and circuits ∟UEENEEE102A Fabricate, assemble and dismantle utilities industry components ∟EENEEE104 Solve problems in D.C. circuits ∟UEENEEE105A Fix and secure electrotechnology equipment ∟UEENEEE107A Use drawings, diagrams, schedules,	60

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	standards, cords and specifications ∟UEENEEG006A Solve problems in single and three phase low voltage machines ∟UEENEEG033A Solve problems in single and three phase low voltage electrical apparatus and circuits ∟UEENEEG063A Arrange circuits, control and protection for general electrical installations ∟UEENEEG101A Solve problems in electromagnetic devices and related circuits ∟UEENEEG102A Solve problems in low voltage A.C. circuits ∟UEENEEG106A Terminate cables, cords and accessories for low voltage circuit	
UEPOPS402	Conduct multiple energy source isolation procedures for permit to work ∟UEPOPS301 Conduct single energy source isolation procedures for permit to work.	40
MEM05020C	Perform advanced welding using gas tungsten arc welding process ∟MEM05007C Perform manual heating and thermal cutting ∟MEM05019D Weld using gas tungsten arc welding process ∟MEM05049B Perform routine gas tungsten arc welding ∟MEM05051A Select welding processes ∟MEM05052A Apply safe welding practices ∟MEM09002B Interpret technical drawing ∟MEM12023A Perform engineering measurements ∟MEM18001C Use hand tools ∟MEM18002B Use power tools/hand held operation	40
MEM05022C	Perform advanced welding using oxy acetylene welding process ∟MEM05004C Perform routine oxy acetylene welding ∟MEM05007C Perform manual heating and thermal cutting ∟MEM05051A Select welding processes	60

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	∟MEM05052A Apply safe welding practices	
	∟MEM09002B Interpret technical drawing	
	∟MEM18001C Use hand tools	
	∟EM18002B Use power tools/hand held operations	
MEM05043B	Perform welds to code standards using gas metal arc welding process	60
	∟MEM05007C Perform manual heating and thermal cutting	
	∟MEM05017D Weld using gas metal arc welding process	
	∟MEM05018C Perform advanced welding using gas metal arc welding process	
	∟MEM05026C Apply welding principles	
	∟MEM05050B Perform routine gas metal arc welding	
	∟MEM05051A Select welding processes	
	∟MEM05052A Apply safe welding practices	
	∟MEM09002B Interpret technical drawing	
	∟MEM12023A Perform engineering measurements	
	∟MEM18001C Use hand tools	
	∟MEM18002B Use power tools/hand held operations	
MEM05044B	Perform welds to code standards using gas tungsten arc welding process	60
	∟MEM05007C Perform manual heating and thermal cutting	
	∟MEM05019D Weld using gas tungsten arc welding process	
	∟MEM05020C Perform advanced welding using gas tungsten arc welding process	
	∟MEM05026C Apply welding principles	
	∟MEM05049B Perform routine gas tungsten arc welding	
	∟MEM05051A Select welding processes	
	∟MEM05052A Apply safe welding practices	
	∟MEM09002B Interpret technical drawing	
	∟MEM12023A Perform engineering measurements	
	∟MEM18001C Use hand tools	

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	∟MEM18002B Use power tools/hand held operations	
MEM05045B	Perform pipe welds to code standards using manual metal arc welding process ∟MEM05007C Perform manual heating and thermal cutting ∟MEM05012C Perform routine manual metal arc welding ∟MEM05015D Weld using manual metal arc welding process ∟MEM05016C Perform advanced welding using manual metal arc welding process ∟MEM05026C Apply welding principles ∟MEM05051A Select welding processes ∟MEM05052A Apply safe welding practices ∟MEM09002B Interpret technical drawing ∟MEM12023A Perform engineering measurements ∟MEM18001C Use hand tools ∟MEM18002B Use power tools/hand held operation	60
MEM05046B	Perform welds to code standards using manual metal arc welding process ∟MEM05007C Perform manual heating and thermal cutting ∟MEM05012C Perform routine manual metal arc welding ∟MEM05015D Weld using manual metal arc welding process ∟MEM05016C Perform advanced welding using manual metal arc welding process ∟MEM05026C Apply welding principles ∟MEM05051A Select welding processes ∟MEM05052A Apply safe welding practices ∟MEM09002B Interpret technical drawing ∟MEM12023A Perform engineering measurements ∟MEM18001C Use hand tools ∟MEM18002B Use power tools/hand held operations	60

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Qualification Mapping Information

This qualification replaces and is equivalent to UEP40412 Certificate IV in ESI Generation Maintenance (Fabrication)

Links

Companion Volume implementation guides are found in VETNet - https://vetnet.gov.au/Pages/TrainingDocs.aspx?q=1715b9fa-e7bd-441c-bb8d-cf22c9c825a8

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UEP40518 Certificate IV in ESI Generation Maintenance (Mechanical)

Modification History

Release 2. This is the second release of this qualification in the Electricity Supply Industry - Generation Sector Training Package. The following modification has been made:

• UEPMNT320 Inspect and repair faults in mechanical equipment and components and UEPMNT406 Install and maintain a steam turbine and UEPMNT311 Maintain fuel transport equipment and UEPMNT313 Maintain internal combustion engines and UEPMNT315 Maintain wind turbines and UEPMNT424 Monitor efficiency of thermal steam cycle power plant and UEPMNT339 Perform sheet metal work and UEPMNT407 Repair a gas turbine unit deleted due to zero enrolment.

Release 1. This is the first release of this qualification in the UEP - Electricity Supply Industry - Generation Sector Training Package.

Qualification Description

Participants gaining this qualification will be able to complete power generation work functions in the electrical supply industry. Functions can include the installation, repair, maintenance of plant and mechanical systems, maintenance planning and scheduling. It also includes observation of safe working practices, supervision of others and the coordination of work activities.

No licensing, legislative or certification requirements apply to this qualification at the time of publication.

Entry Requirements

There are no entry requirements for this qualification.

Packaging Rules

A total 1280 weighting points comprising 770 core weighting points, plus 510 elective weighting points from the general elective units listed below.

Choose a total of 730 weighting point from the general elective units list below of which between0 and 220 weighting points can be taken from Group A. A total of 310 weighting points may be taken from Group B. Between 200 and 510 weighting points may be taken from Group C, you may select all your elective units from this group.

Up to 220 weighting points of the general elective units Group A, may be selected, with appropriate contextualisation, from any relevant nationally endorsed Training Package or accredited course, provided that selected units contribute to the vocational outcome of the qualification. Previously assigned weighting points are listed in UEP CVIG, if not listed

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weighting points will be 10 points unless directed from the ESI Generation Industry Reference Committee (IRC). The general elective units must contribute to the vocational outcomes of the qualification.

Where imported units are selected, care must be taken to ensure that all prerequisite units specified are complied with.

Where a prerequisite unit is attached to a unit, it is identified by this symbol ∟.

Core units		**Weighting points**
MEM07005C	Perform general machining ∟ MEM09002 Interpret technical drawing ∟ MEM12023A Perform engineering measurements ∟ MEM18001C Use hand tools	80
MEM07006C	Perform lathe operations ∟ MEM07005C Perform general machining ∟ MEM09002B Interpret technical drawing ∟ MEM12023A Perform engineering measurements ∟ MEM18001C Use hand tools	40
MEM07007C	Perform milling operations ∟ MEM07005C Perform general machining ∟ MEM09002B Interpret technical drawing ∟ MEM12023A Perform engineering measurements ∟ MEM18001C Use hand tools	40
MEM07008D	Perform grinding operations ∟ MEM07005C Perform general machining ∟ MEM09002B Interpret technical drawing ∟ MEM12023A Perform engineering measurements ∟ MEM18001C Use hand tools	40
MEM09002B	Interpret technical drawing	40
MEM12003B	Perform precision mechanical measurement ∟ MEM12023A Perform engineering measurements	20
MEM12023A	Perform engineering measurements	50
MEM12024A	Perform computations	30

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MEM18001C	Use hand tools	20
MEM18002B	Use power tools/hand held operations	20
MEM18003C	Use tools for precision work	40
	∟MEM12023A Perform engineering measurements	
	∟MEM18001C Use hand tools	
	∟MEM18002B Use power tools/hand held operations	
MEM18006C	Repair and fit engineering components	60
	∟MEM09002B Interpret technical drawing	
	∟MEM12023A Perform engineering measurements	
	∟MEM18001C Use hand tools	
	∟MEM18002B Use power tools/hand held operations	
	∟MEM18003C Use tools for precision work	
	∟MEM18055B Dismantle, replace and assemble engineering components	
MEM18007B	Maintain and repair mechanical drives and mechanical transmission assemblies	40
	∟MEM09002B Interpret technical drawing	
	∟MEM12023A Perform engineering measurements	
	∟MEM18001C Use hand tools	
	∟MEM18002B Use power tools/hand held operations	
	∟MEM18003C Use tools for precision work	
	∟MEM18006C Repair and fit engineering components	
	∟MEM18009B Perform levelling and alignment of machines and engineering components	
	∟MEM18055B Dismantle, replace and assemble engineering components	
MEM18009B	Perform levelling and alignment of machines and engineering components	40
	∟MEM09002B Interpret technical drawing	
	∟MEM12023A Perform engineering measurements	
	∟MEM18001C Use hand tools	
	∟MEM18002B Use power tools/hand held operations	
	∟MEM18003C Use tools for precision work	

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	∟MEM18006C Repair and fit engineering components ∟MEM18055B Dismantle, replace and assemble engineering components	
MEM18055B	Dismantle, replace and assemble engineering components ∟MEM09002B Interpret technical drawing ∟MEM12023A Perform engineering measurements ∟MEM18001C Use hand tools ∟MEM18002B Use power tools/hand held operations	30
UEENEEE117A	Implement and monitor energy sector OHS policies and procedures	20
UEENEEE101A	Apply Occupational, Health and Safety regulations, codes and practices in the workplace	20
UEPOPS202	Apply quality systems to work	20
UEPOPS337	Maintain quality systems within the team ∟UEPOPS202 Apply quality systems to work	20
UEPOPS338	Facilitate workplace communication	20
UEPOPS417	Monitor and implement environmental site plans and procedures	20
UEPOPS430	Control permit to work operations	30
UEPOPS439	Plan and organise work	30

Group A elective units		**Weighting points**
BSBCUS401	Coordinate implementation of customer service strategies	40
BSBINM401	Implement workplace information system	40
BSBINN301	Promote innovation in a team environment	40
BSBLED401	Develop teams and individuals	40
BSBMGT402	Implement operational plan	40

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BSBMGT403	Implement continuous improvement	40
BSBLDR402	Lead effective workplace relationships	50
BSBLDR403	Lead team effectiveness	50
BSBWOR404	Develop work priorities	40
CPCCCM2007B	Use explosive power tools ∟CPCCOHS2001A Apply OHS requirements, policies and procedures in the construction industry	15
CPCCLDG3001A	Licence to perform dogging	30
CPCCLRG3001A	Licence to perform rigging basic level ∟CPCCLDG3001A Licence to perform dogging	40
CPCCLRG3002A	Licence to perform rigging intermediate level ∟CPCCLRG3001A Licence to perform rigging basic level	40
CPCCLSF2001A	Licence to erect, alter and dismantle scaffolding basic level	40
MEM09003B	Prepare basic engineering drawing ∟MEM09002B Interpret technical drawing	80
MEM09004B	Perform electrical/electronic detail drafting ∟MEM09002B Interpret technical drawing ∟MEM09003B Prepare basic engineering drawing	80
MEM09005B	Perform basic engineering detail drafting ∟MEM09002B Interpret technical drawing ∟MEM09003B Prepare basic engineering drawing	80
MEM09006B	Perform advanced engineering detail drafting ∟MEM09002B Interpret technical drawing ∟MEM09003B Prepare basic engineering drawing ∟MEM09005B Basic engineering detail drafting	40
RIIHAN309E	Conduct telescopic materials handler operations	80

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TAEDEL301	Provide work skill instruction	40
TLILIC0002	Licence to operate a vehicle loading crane (capacity 10 metre tonnes and above)	40
TLILIC0003	Licence to operate a forklift truck	40
TLILIC0005	Licence to operate a boom type elevating work platform (boom length 11 metres or more)	30
TLILIC0008	Licence to operate a non-slewing mobile crane (greater than 3 tonnes capacity)	60

Group B elective units		**Weighting points**
MEM05004C	Perform routine oxy acetylene welding	20
MEM05007C	Perform manual heating and thermal cutting	20
MEM05012C	Perform routine manual metal arc welding	20
MEM18010C	Perform equipment condition monitoring and recording ∟MEM09002B Interpret technical drawing ∟MEM12023A Perform engineering measurements ∟MEM18001C Use hand tools ∟MEM18002B Use power tools/hand held operations ∟MEM18055B Dismantle, replace and assemble engineering components	40
MEM18018C	Maintain pneumatic system components ∟MEM09002B Interpret technical drawing ∟MEM12023A Perform engineering measurements ∟MEM18001C Use hand tools ∟MEM18002B Use power tools/hand held operations ∟MEM18003C Use tools for precision work ∟MEM18006C Repair and fit engineering components ∟MEM18055B Dismantle, replace and assemble engineering components	40
MEM18020B	Maintain hydraulic system components ∟MEM09002B Interpret technical drawing	40

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	∟MEM12023A Perform engineering measurements	
	∟MEM18001C Use hand tools	
	∟MEM18002B Use power tools/hand held operations	
	∟MEM18003C Use tools for precision work	
	∟MEM18006C Repair and fit engineering components	
	∟MEM18055B Dismantle, replace and assemble engineering components	
UEPMNT302	Install and maintain industrial pipe work	40
	∟ MEM18006C Repair and fit engineering components	
	∟MEM09002B Interpret technical drawing	
	∟MEM12023A Perform engineering measurements	
	∟MEM18001C Use hand tools	
	∟MEM18002B Use power tools/hand held operations	
	∟MEM18003C Use tools for precision work	
	∟MEM18055B Dismantle, replace and assemble engineering components	
UEPMNT303	Maintain mechanical valves	40
	∟MEM18006C Repair and fit engineering components	
	∟MEM09002B Interpret technical drawing	
	∟MEM12023A Perform engineering measurements	
	∟MEM18001C Use hand tools	
	∟MEM18002B Use power tools/hand held operations	
	∟MEM18003C Use power tools/hand held operations	
	∟MEM18055B Dismantle, replace and assemble engineering components	
UEPMNT304	Maintain mechanical pumps	40
	∟MEM18006C Repair and fit engineering components	
	∟MEM09002B Interpret technical drawing	
	∟MEM12023A Perform engineering measurements	
	∟MEM18001C Use hand tools	
	∟MEM18002B Use power tools/hand held operations	
	∟MEM18003C Use tools for precision work	
	∟MEM18055B Dismantle, replace and assemble engineering components	

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UEPMNT305	Maintain industrial fans	40
	∟ MEM18006C Repair and fit engineering components	
	∟ MEM09002B Interpret technical drawing	
	∟ MEM12023A Perform engineering measurements	
	∟ MEM18001C Use hand tools	
	∟ MEM18002B Use power tools/hand held operations	
	∟ MEM18003C Use tools for precision work	
	∟ MEM18055B Dismantle, replace and assemble engineering components	
UEPMNT307	Maintain industrial screens, strainers and filters	20
	∟ MEM18006C Repair and fit engineering components	
	∟ MEM09002B Interpret technical drawing	
	∟ MEM12023A Perform engineering measurements	
	∟ MEM18001C Use hand tools	
	∟ MEM18002B Use power tools/hand held operations	
	∟ MEM18003C Use tools for precision work	
	∟ MEM18055B Dismantle, replace and assemble engineering components	
UEPMNT308	Maintain conveyors and associated equipment	40
	∟ MEM18006C Repair and fit engineering components	
	∟ MEM09002B Interpret technical drawing	
	∟ MEM12023A Perform engineering measurements	
	∟ MEM18001C Use hand tools	
	∟ MEM18002B Use tools for precision work	
	∟ MEM18055B Dismantle, replace and assemble engineering components	
UEPMNT309	Maintain material feeders	40
	∟ MEM18006C Repair and fit engineering components	
	∟ MEM09002B Interpret technical drawing	
	∟ MEM12023A Perform engineering measurements	
	∟ MEM18001C Use hand tools	
	∟ MEM18002B Use power tools/hand held operations	
	∟ MEM18003C Use tools for precision work	

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	∟MEM18055B Dismantle, replace and assemble engineering components	
UEPMNT310	Maintain material crushers	40
	∟MEM18006C Repair and fit engineering components	
	∟MEM09002B Interpret technical drawing	
	∟MEM12023A Perform engineering measurements	
	∟MEM18001C Use hand tools	
	∟MEM18002B Use power tools/hand held operations	
	∟MEM18003C Use tools for precision work	
	∟MEM18055B Dismantle, replace and assemble engineering components	
UEPMNT312	Maintain industrial pressure vessels	80
	∟MEM18006C Repair and fit engineering components	
	∟MEM09002B Interpret technical drawing	
	∟MEM12023A Perform engineering measurements	
	∟MEM18001C Use hand tools	
	∟MEM18002B Use power tools/hand held operations	
	∟MEM18003C Use tools for precision work	
	∟MEM18055B Dismantle, replace and assemble engineering components	
UEPMNT314	Maintain hydro turbines	100
UEPMNT317	Diagnose and repair faults in mechanical equipment	40
	∟MEM18006C Repair and fit engineering components	
	∟MEM09002B Interpret technical drawing	
	∟MEM12023A Perform engineering measurements	
	∟MEM18001C Use hand tools	
	∟MEM18002B Use power tools/hand held operations	
	∟MEM18003C Use tools for precision work	
	∟MEM18055B Dismantle, replace and assemble engineering components	
UEPMNT318	Conduct generator mechanical maintenance	80
	∟MEM18006C Repair and fit engineering components	
	∟MEM09002B Interpret technical drawing	

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	∟MEM12023A Perform engineering measurements	
	∟MEM18001C Use hand tools	
	∟MEM18002B Use power tools/hand held operations	
	∟MEM18003C Use tools for precision work	
	∟MEM18055B Dismantle, replace and assemble engineering components	
UEPMNT340	Fabricate metal structures and components	40
	∟MEM18006C Repair and fit engineering components	
	∟MEM09002B Interpret technical drawing	
	∟MEM12023A Perform engineering measurements	
	∟MEM18001C Use hand tools	
	∟MEM18002B Use power tools/hand held operations	
	∟MEM18003C Use tools for precision work	
	∟MEM18055B Dismantle, replace and assemble engineering components	
UEPMNT367	Install and commission stationary gas fuelled reciprocating engines	60
	∟CPCCWHS1001 Prepare to work safely in the construction industry	
	∟HLTAID001 Provide cardiopulmonary resuscitation	
UEPMNT368	Repair and maintain stationary gas fuelled reciprocating engines	60
	∟CPCCWHS1001 Prepare to work safely in the construction industry	
	∟HLTAID001 Provide cardiopulmonary resuscitation	
UEPOPS301	Conduct single energy source isolation procedures for permit to work	40

Group C elective units		**Weighting points**
UEPMNT401	Install and maintain complex mechanical seals	40
	∟UEPMNT304 Maintain mechanical pumps	
	∟MEM18006C Repair and fit engineering components	
	∟MEM09002B Interpret technical drawing	
	∟MEM12023A Perform engineering measurements	

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	∟MEM18001C Use hand tools	
	∟MEM18002B Use power tools/hand held operations	
	∟MEM18003C Use tools for precision work	
	∟MEM18055B Dismantle, replace and assemble engineering components	
UEPMNT402	Conduct complex levelling and alignment	40
	∟MEM18009B Perform levelling and alignment of machines and engineering components	
	∟MEM09002B Interpret technical drawing	
	∟MEM12023A Perform engineering measurements	
	∟MEM18001C Use hand tools	
	∟MEM18002B Use power tools/hand held operations	
	∟MEM18003C Use tools for precision work	
	∟MEM18055B Dismantle, replace and assemble engineering components	
	∟MEM18006C Repair and fit engineering components	
UEPMNT403	Maintain complex mechanical valves	40
	∟UEPMNT303 Maintain mechanical valves	
	∟MEM18006C Repair and fit engineering components	
	∟MEM09002B Interpret technical drawing	
	∟MEM12023A Perform engineering measurements	
	∟MEM18001C Use hand tools	
	∟MEM18002B Use power tools/hand held operations	
	∟MEM18003C Use tools for precision work	
	∟MEM18055B Dismantle, replace and assemble engineering components	
UEPMNT404	Maintain complex mechanical pumps	40
	∟UEPMNT304 Maintain mechanical pumps	
	∟MEM18006C Repair and fit engineering components	
	∟MEM09002B Interpret technical drawing	
	∟MEM12023A Perform engineering measurements	
	∟MEM18001C Use hand tools	
	∟MEM18002B Use power tools/hand held operations	
	∟MEM18003C Use tools for precision work	

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	∟MEM18055B Dismantle, replace and assemble engineering components	
UEPMNT408	Install hydro turbines	100
	∟UEPMNT402 Conduct complex levelling and alignment	
	∟MEM18009B Perform levelling and alignment of machines and engineering components	
	∟MEM09002B Interpret technical drawing	
	∟MEM12023A Perform engineering measurements	
	∟MEM18001C Use hand tools	
	∟MEM18002B Use power tools/hand held operations	
	∟MEM18003C Use tools for precision work	
	∟MEM18055B Dismantle, replace and assemble engineering components	
	∟MEM18006C Repair and fit engineering components	
UEPMNT419	Perform civil drafting	60
	∟UEENEEE107A Use drawings, diagrams, schedules, standards, cords and specifications	
	∟MEM09002B Interpret technical drawing	
UEPMNT421	Conduct technical inspection of process plant and equipment	60
	∟UEPMNT351 Test and commission electrical equipment	
	∟UEENEEG108A Troubleshoot and repair faults in low voltage electrical apparatus and circuits	
	∟UEENEEE102A Fabricate, dismantle, assemble of utilities industry components	
	∟UEENEEE104A Solve problems in D.C. circuits	
	∟UEENEEE105A Fix and secure electrotechnology equipment	
	∟UEENEEE107A Use drawings, diagrams, schedules, standards, cords and specifications	
	∟UEENEEG006A Solve problems in single and three phase low voltage machines	
	∟UEENEEG033A Solve problems in single and three phase low voltage electrical apparatus and circuits	
	∟UEENEEG063A Arrange circuits, control and	

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	protection for general electrical installations ∟UEENEEG101A Solve problems in electromagnetic devices and related circuits ∟UEENEEG102A Solve problems in low voltage A.C. circuits ∟UEENEEG106A Terminate cables, cords and accessories for low voltage circuits	
UEPMNT422	Conduct performance testing on process plant and equipment ∟UEPMNT351 Test and commission electrical equipment ∟UEENEEG108A Troubleshoot and repair faults in low voltage electrical apparatus and circuits ∟UEENEEE102A Fabricate, dismantle, assemble of utilities industry components ∟UEENEEE104A Solve problems in D.C. circuits ∟UEENEEE105A Fix and secure electrotechnology equipment ∟UEENEEE107A Use drawings, diagrams, schedules, standards, cords and specifications ∟UEENEEG006A Solve problems in single and three phase low voltage machines ∟UEENEEG033A Solve problems in single and three phase low voltage electrical apparatus and circuits ∟UEENEEG063A Arrange circuits, control and protection for general electrical installations ∟UEENEEG101A Solve problems in electromagnetic devices and related circuits ∟UEENEEG102A Solve problems in low voltage A.C. circuits ∟UEENEEG106A Terminate cables, cords and accessories for low voltage circuits	60
UEPOPS402	Conduct multiple energy source isolation procedures for permit to work ∟UEPOPS301 Conduct single energy source isolation procedures for permit to work.	40
MEM07011B	Perform complex milling operations ∟MEM07005C Perform general machining	40

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	∟MEM07007C Perform milling operations	
	∟MEM09002B Interpret technical drawing	
	∟MEM12003B Perform precision mechanical measurement	
	∟MEM12023A Perform engineering measurements	
	∟MEM12024A Perform computations	
	∟MEM18001C Use hand tools	
MEM07012B	Perform complex grinding operations	40
	∟MEM07005C Perform general machining	
	∟MEM07008D Perform grinding operations	
	∟MEM09002B Interpret technical drawing	
	∟MEM12003B Perform precision mechanical measurement	
	∟MEM12023A Perform engineering measurements	
	∟MEM18001C Use hand tools	
MEM07021B	Perform complex lathe operations	40
	∟MEM07005C Perform general machining	
	∟MEM07006C Perform lathe operations	
	∟MEM09002B Interpret technical drawing	
	∟MEM12003B Perform precision mechanical measurement	
	∟MEM12023A Perform engineering measurements	
	∟MEM12024A Perform computations	
	∟MEM18001C Use hand tools	
MEM18019B	Maintain pneumatic systems	40
	∟MEM09002B Interpret technical drawing	
	∟ MEM12023A Perform engineering measurements	
	∟MEM18001C Use hand tools	
	∟MEM18002B Use power tools/hand held operations	
	∟MEM18003C Use tools for precision work	
	∟MEM18006C Repair and fit engineering components	
	∟MEM18018C Maintain pneumatic system components	
	∟MEM18055B Dismantle, replace and assemble engineering components	

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MEM18021B	Maintain hydraulic systems	40
	∟MEM09002B Interpret technical drawing	
	∟MEM12023A Perform engineering measurements	
	∟MEM18001C Use hand tools	
	∟MEM18002B Use power tools/hand held operations	
	∟MEM18003C Use tools for precision work	
	∟MEM18006C Repair and fit engineering components	
	∟MEM18020B Maintain hydraulic system components	
	∟MEM18055B Dismantle, replace and assemble engineering components	
MEM18022B	Maintain fluid power controls	80
	∟MEM09002B Interpret technical drawing	
	∟MEM12023A Perform engineering measurements	
	∟MEM18001C Use hand tools	
	∟MEM18002B Use power tools/hand held operations	
	∟MEM18003C Use tools for precision work	
	∟MEM18006C Repair and fit engineering components	
	∟MEM18018C Maintain pneumatic system components	
	∟MEM18019B Maintain pneumatic systems	
	∟MEM18055B Dismantle, replace and assemble engineering components	
	∟MEM18020B Maintain hydraulic system components	
	∟MEM18021B Maintain hydraulic systems	
	∟MEM18055B Dismantle, replace and assemble engineering components	

Qualification Mapping Information

This qualification replaces and is equivalent to UEP40312 Certificate IV in ESI Generation Maintenance (Mechanical)

Links

Companion Volume implementation guides are found in VETNet - https://vetnet.gov.au/Pages/TrainingDocs.aspx?q=1715b9fa-e7bd-441c-bb8d-cf22c9c825a8

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UEP40618 Certificate IV in Large Scale Wind Generation - Electrical

Modification History

Release 1. This is the first release of this qualification in the UEP - Electricity Supply Industry - Generation Sector Training Package.

Qualification Description

Participants gaining this qualification will be able to operate, test, find and diagnose faults and alter and repair electrical equipment and systems associated with large scale wind power generation. It may also include the supervision of others and the coordination of work activities.

This qualification may meet the requirements for a Restricted Electricians Licence (Electrical Fitter). Licensing requirements should be confirmed with the relevant state/territory licensing and regulatory authorities.

No licensing, legislative or certification requirements apply to this qualification at the time of publication.

Entry Requirements

There are no entry requirements for this qualification.

Packaging Rules

A total 1280 weighting points comprising 900 core weighting points, plus 380 elective weighting points from the general elective units listed below.

Choose a total of 380 weighting point from the general elective units list below of which between 0 and 60 weighting points can be taken from Group A. A total of 120 weighting points can be selected from Group B. Between 260 and 380 weighting points may be taken from Group C, you may select all your elective units from this group.

Up to 60 weighting points of the general elective units Group A, may be selected, with appropriate contextualisation, from any relevant nationally endorsed Training Package or accredited course, provided that selected units contribute to the vocational outcome of the qualification. Previously assigned weighting points are listed in UEP CVIG, if not listed weighting points will be 10 points unless directed from the ESI Generation Industry Reference Committee (IRC). The general elective units must contribute to the vocational outcomes of the qualification.

Where imported units are selected, care must be taken to ensure that all prerequisite units specified are complied with.

Where a prerequisite unit is attached to a unit, it is identified by this symbol ∟.

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Core units		**Weighting points**
UEENEEE101A	Apply Occupational, Health and Safety regulations, codes and practices in the workplace	20
UEENEEE102A	Fabricate, assemble and dismantle utilities industry components ∟UEENEEE101A Apply Occupational, Health and Safety regulations, codes and practices in the workplace	40
UEENEEE104A	Solve problems in D.C. circuits ∟UEENEEE101A Apply Occupational, Health and Safety regulations, codes and practices in the workplace	80
UEENEEE105A	Fix and secure electrotechnology equipment ∟UEENEEE101A Apply Occupational, Health and Safety regulations, codes and practices in the workplace	20
UEENEEE107A	Use drawings, diagrams, schedules, standards, codes and specifications ∟UEENEEE101A Apply Occupational, Health and Safety regulations, codes and practices in the workplace	40
UEENEEE117A	Implement and monitor energy sector OHS policies and procedures	20
UEENEEE185A	Write work activity reports	20
UEENEEE137A	Document and apply measures to control OHS risks associated with electrotechnology work ∟UEENEEE101AApply Occupational, Health and Safety regulations, codes and practices in the workplace	20
UEENEEE038B	Participate in development and follow a personal competency development plan	20
UEENEEG006A	Solve problems in single and three phase low voltage machines ∟UEENEEE101AApply Occupational, Health and Safety regulations, codes and practices in the workplace ∟UEENEEE102A Fabricate, dismantle, assemble of electrotechnology components ∟UEENEEE104A Solve problems in D.C circuits ∟UEENEEE105A Fix and secure electrotechnology	80

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	equipment ∟UEENEEE107A Use drawings, diagrams, schedules, standards, codes and specifications ∟UEENEEG101A Solve problems in electromagnetic devices and related circuits ∟UEENEEG102A Solve problems in low voltage A.C. circuit ∟UEENEEG106A Terminate cables, cords and accessories for low voltage circuits	
UEENEEG033A	Solve problems in single and three phase low voltage electrical apparatus and circuits ∟UEENEEE101A Apply Occupational, Health and Safety regulations, codes and practices in the workplace ∟UEENEEE102A Fabricate, dismantle, assemble of electrotechnology components ∟UEENEEE104A Solve problems in D.C circuits ∟UEENEEE105A Fix and secure electrotechnology equipment ∟UEENEEE107A Use drawings, diagrams, schedules, standards, codes and specifications ∟UEENEEG101A Solve problems in electromagnetic devices and related circuits ∟UEENEEG102A Solve problems in low voltage A.C. circuit ∟UEENEEG106A Terminate cables, cords and accessories for low voltage circuits	60
UEENEEG063A	Arrange circuits, control and protection for general electrical installations ∟UEENEEE101A Apply Occupational, Health and Safety regulations, codes and practices in the workplace ∟UEENEEE102A Fabricate, dismantle, assemble of electrotechnology components ∟UEENEEE104A Solve problems in D.C circuits ∟UEENEEE105A Fix and secure electrotechnology equipment ∟UEENEEE107A Use drawings, diagrams, schedules, standards, codes and specifications ∟UEENEEG101A Solve problems in electromagnetic	40

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	devices and related circuits ∟UEENEEG102A Solve problems in low voltage A.C. circuit ∟UEENEEG106A Terminate cables, cords and accessories for low voltage circuits	
UEENEEG101A	Solve problems in electromagnetic devices and related circuits ∟UEENEEE101A Apply Occupational, Health and Safety regulations, codes and practices in the workplace ∟UEENEEE104A Solve problems in D.C circuits	60
UEENEEG102A	Solve problems in low voltage A.C. circuits ∟UEENEEE101A Apply Occupational, Health and Safety regulations, codes and practices in the workplace ∟UEENEEE104A Solve problems in D.C circuits ∟UEENEEG101A Solve problems in electromagnetic devices and related circuits	80
UEENEEG106A	Terminate cables, cords and accessories for low voltage circuits ∟UEENEEE101A Apply Occupational, Health and Safety regulations, codes and practices in the workplace ∟UEENEEE102A Fabricate, assemble and dismantle utilities industry components ∟UEENEEE105A Fix and secure electrotechnology equipment ∟UEENEEE107A Use drawings, diagrams, schedules, standards, codes and specifications	40
UEENEEG108A	Troubleshoot and repair faults in low voltage electrical apparatus and circuits ∟UEENEEE101A Apply Occupational, Health and Safety regulations, codes and practices in the workplace ∟UEENEEE102A Fabricate, dismantle, assemble of utilities components ∟UEENEEE104A Solve problems in D.C. circuits ∟UEENEEE105A Fix and secure electrotechnology equipment ∟UEENEEE107A Use drawings, diagrams, schedules, standards, codes and specifications	40

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	∟UEENEEG006A Solve problems in single and three phase low voltage machines	
	∟UEENEEG033A Solve problems in single and three phase electrical apparatus and circuits	
	∟UEENEEG063A Arrange circuits, control and protection for general electrical installations	
	∟UEENEEG101A Solve problems in electromagnetic devices and related circuits	
	∟UEENEEG102A Solve problems in low voltage A.C. circuits	
	∟UEENEEG106A Terminate cables, cords and accessories for low voltage circuits	
UEENEEG109A	Develop and connect electrical control circuits	80
	∟UEENEEE101AApply Occupational, Health and Safety regulations, codes and practices in the workplace	
	∟UEENEEE102A Fabricate, dismantle, assemble of electrotechnology components	
	∟UEENEEE104A Solve problems in D.C circuits	
	∟UEENEEE105A Fix and secure electrotechnology equipment	
	∟UEENEEE107A Use drawings, diagrams, schedules, standards, codes and specifications	
	∟UEENEEG006A Solve problems in single and three phase low voltage machines	
	∟UEENEEG063A Arrange circuits, control and protection for general electrical installations	
	∟UEENEEG101A Solve problems in electromagnetic devices and related circuits	
	∟UEENEEG102A Solve problems in low voltage A.C. circuit	
	∟UEENEEG106A Terminate cables, cords and accessories for low voltage circuit	
UEENEEG199A	Conduct compliance and functional verification of electrical apparatus and existing circuits	40
	∟UEENEEE101A Apply Occupational, Health and Safety regulations, codes and practices in the workplace	
	∟UEENEEE102A Fabricate, dismantle and assemble and utilities components	

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	∟UEENEEE104A Solve problems in D.C circuits	
	∟UEENEEE105A Fix and secure electrotechnology equipment	
	∟UEENEEE107A Use drawings, diagrams, schedules, standards, codes and specifications	
	∟UEENEEE137A Document and apply measures to control OHS risks associated with electrotechnology work	
	∟UEENEEG006A Solve problems in single and three phase low voltage machines	
	∟UEENEEG033A Solve problems in single and three phase electrical apparatus and circuits	
	∟UEENEEG063A Arrange circuits, control and protection for general electrical installations	
	∟UEENEEG101ASolve problems in electromagnetic devices and related circuits	
	∟UEENEEG102A Solve problems in low voltage A.C. circuits	
	∟UEENEEG106A Terminate cables, cords and accessories for low voltage circuits	
	∟UEENEEG108A Troubleshoot and repair faults in electrical apparatus and circuits	
	∟UEENEEG109A Develop and connect electrical control circuits	
UEENEEK145A	Implement and monitor energy sector environmental and sustainable policies and procedures	20
UEPMNT202	Carry out routine work activities in an ESI large scale wind generation environment	20
UEPMNT371	Maintain large scale wind turbine generators	60

Group A elective units		**Weighting points**
UEENEEC001B	Maintain documentation	20
UEENEEC010B	Deliver a service to customers	20
UEENEED101A	Use computer applications relevant to a workplace	20
	∟UEENEEE101A Apply Work, Health Safety regulations, codes and practices in the workplace.	

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UEENEEE009B	Comply with scheduled and preventative maintenance program processes	20

Group B elective units		**Weighting points**
UEENEED104A	Use engineering applications software on personal computers	40
	∟UEENEEE101A Apply Work, Health Safety regulations, codes and practices in the workplace	
UEENEEI116A	Assemble, enter and verify operating instructions in microprocessor equipped devices	20
	∟UEENEEE101A Apply Work, Health Safety regulations, codes and practices in the workplace	
UEENEEI150A	Develop, enter and verify discrete control programs for programmable controllers	60
	∟UEENEEE101A Apply Occupational, Health and Safety regulations, codes and practices in the workplace	
UEENEEF102A	Install and maintain cabling for multiple access to telecommunication services	120
	∟UEENEEE101A Apply Occupational, Health and Safety regulations, codes and practices in the workplace	
	∟UEENEEE102A Fabricate, assemble and dismantle utilities industry components	
	∟UEENEEE104A Solve problems in D.C. circuits	
	∟UEENEEE105A Fix and secure electrotechnology equipment	
	∟UEENEEE107A Use drawings, diagrams, schedules, standards, codes and specifications	
UEENEEF104A	Install and modify performance data communication copper cabling	40
	∟UEENEEE101A Apply Occupational, Health and Safety regulations, codes and practices in the workplace	
	∟UEENEEE102A Fabricate, assemble and dismantle utilities industry components	
	∟UEENEEE104A Solve problems in D.C. circuits	
	∟UEENEEE105A Fix and secure electrotechnology equipment	
	∟UEENEEE107A Use drawings, diagrams, schedules,	

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	standards, codes and specifications	
	∟UEENEEF102A Install and maintain cabling for multiple access to telecommunication services	
UEENEEF107A	Set up and configure the wireless capabilities of communications and data storage devices	40
	∟UEENEEE101A Apply Occupational, Health and Safety regulations, codes and practices in the workplace	
UEENEEF108A	Select and arrange equipment for wireless communication networks	40
	∟UEENEEE101A Apply Occupational, Health and Safety regulations, codes and practices in the workplace	
UEENEEF111A	Test, report and rectify faults in data and voice installations	40
	∟UEENEEE101A Apply Occupational, Health and Safety regulations, codes and practices in the workplace	
	∟UEENEEE102A Fabricate, assemble and dismantle utilities industry components	
	∟UEENEEE104A Solve problems in D.C. circuits	
	∟UEENEEE105A Fix and secure electrotechnology equipment	
	∟UEENEEE107A Use drawings, diagrams, schedules, standards, codes and specifications	
	∟UEENEEF102A Install and maintain cabling for multiple access to telecommunication services	
	∟UEENEEF104A Install and modify performance data communication copper cabling	
	∟UEENEEF105A Install and modify optical fibre performance data communication cabling	
UEENEEG110A	Find and repair faults in L.V. D.C. electrical apparatus and circuits	60
	∟UEENEEE101A Apply Occupational, Health and Safety regulations, codes and practices in the workplace	
	∟UEENEEE102A Fabricate, dismantle, assemble of utilities components	
	∟UEENEEE104A Solve problems in D.C circuits	
	∟UEENEEE105A Fix and secure electrotechnology equipment	
	∟UEENEEE107A Use drawings, diagrams, schedules,	

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	standards, codes and specifications	
	∟UEENEEG006A Solve problems in single and three phase low voltage machines	
	∟UEENEEG033A Solve problems in single and three phase electrical apparatus and circuits	
	∟UEENEEG063A Arrange circuits, control and protection for general electrical installations	
	∟UEENEEG101A Solve problems in electromagnetic devices and related circuits	
	∟UEENEEG102A Solve problems in low voltage A.C. circuit	
	∟UEENEEG106A Terminate cables, cords and accessories for low voltage circuits	
	∟UEENEEG108A Troubleshoot and repair faults in low voltage electrical apparatus and circuits	
UEENEEG111A	Carry out basic repairs to electrical components and equipment	40
	∟UEENEEE101A Apply Occupational, Health and Safety regulations, codes and practices in the workplace	
	∟UEENEEE102A Fabricate, assemble and dismantle utilities industry components	
UEENEEG116A	Diagnose and rectify faults in traction lift systems	80
	∟UEENEEE101A Apply Occupational, Health and Safety regulations, codes and practices in the workplace	
	∟UEENEEE102A Fabricate, dismantle, assemble of utilities components	
	∟UEENEEE104A Solve problems in D.C circuits	
	∟UEENEEE105A Fix and secure electrotechnology equipment	
	∟UEENEEE107A Use drawings, diagrams, schedules, standards, codes and specifications	
	∟UEENEEG006A Solve problems in single and three phase low voltage machines	
	∟UEENEEG033A Solve problems in single and three phase electrical apparatus and circuits	
	∟UEENEEG063A Arrange circuits, control and protection for general electrical installations	
	∟UEENEEG101A Solve problems in electromagnetic	

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	devices and related circuits	
	∟UEENEEG102A Solve problems in low voltage A.C. circuit	
	∟UEENEEG106A Terminate cables, cords and accessories for low voltage circuits	
	∟UEENEEG108A Troubleshoot and repair faults in low voltage electrical apparatus and circuits	
UEENEEG129A	Overhaul and repair major switchgear and control gear	60
	∟UEENEEE101A Apply Occupational, Health and Safety regulations, codes and practices in the workplace	
	∟UEENEEE102A Fabricate, dismantle, assemble of utilities components	
	∟UEENEEE104A Solve problems in D.C circuits	
	∟UEENEEE105A Fix and secure electrotechnology equipment	
	∟UEENEEE107A Use drawings, diagrams, schedules, standards, codes and specifications	
	∟UEENEEG111A Carry out basic repairs to electrical components and equipment	
	∟UEENEEG164A Repair and maintain mechanical components of electrical machines	
UEENEEG157A	Conduct electrical tests on L.V. electrical machines	40
	∟UEENEEE101A Apply Occupational, Health and Safety regulations, codes and practices in the workplace	
	∟UEENEEE102A Fabricate, assemble and dismantle utilities industry components	
	∟UEENEEE104A Solve problems in D.C. circuits	
	∟UEENEEE105A Fix and secure electrotechnology equipment	
	∟UEENEEE107A Use drawings, diagrams, schedules, standards, codes and specifications	
	∟UEENEEG006A Solve problems in single and three phase low voltage machines	
	∟UEENEEG101A Solve problems in electromagnetic devices and related circuits	
	∟UEENEEG102A Solve problems in low voltage A.C. circuits	
	∟UEENEEG106A Terminate cables, cords and	

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	accessories for low voltage circuits ∟UEENEEG150A Wind electrical coils ∟UEENEEG151A Place and connect electrical coils ∟UEENEEG153A Rewind three phase low voltage induction machines ∟UEENEEG033A Solve problems in single and three phase electrical apparatus and circuits ∟UEENEEG063A Arrange circuits, control and protection for general electrical installations ∟UEENEEG108A Troubleshoot and repair faults in low voltage electrical apparatus and circuits	
UEENEEG159A	Conduct mechanical tests on electrical machines and components ∟UEENEEG157A Conduct electrical tests on LV electrical machines ∟UEENEEE101A Apply Occupational, Health and Safety regulations, codes and practices in the workplace ∟UEENEEE102A Fabricate, assemble and dismantle utilities industry components ∟UEENEEE104A Solve problems in D.C. circuits ∟UEENEEE105A Fix and secure electrotechnology equipment ∟UEENEEE107A Use drawings, diagrams, schedules, standards, codes and specifications ∟UEENEEG006A Solve problems in single and three phase low voltage machines ∟UEENEEG101A Solve problems in electromagnetic devices and related circuits ∟UEENEEG102A Solve problems in low voltage A.C. circuits ∟UEENEEG106A Terminate cables, cords and accessories for low voltage circuits ∟UEENEEG150 Wind electrical coils ∟UEENEEG151 Place and connect electrical coils ∟UEENEEG153 Rewind three phase low voltage induction machines ∟UEENEEG033A Solve problems in single and three phase electrical apparatus and circuits	40

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	∟UEENEEG063A Arrange circuits, control and protection for general electrical installations	
	∟UEENEEG108AA Troubleshoot and repair faults in low voltage electrical apparatus and circuits	
UEENEEG164A	Repair and maintain mechanical components of electrical machines	40
	∟UEENEEE101A Apply Occupational, Health and Safety regulations, codes and practices in the workplace	
	∟UEENEEE102A Fabricate, assemble and dismantle utilities industry components	
	∟UEENEEE105A Fix and secure electrotechnology equipment	
	∟UEENEEE107A Use drawings, diagrams, schedules, standards, codes and specifications	
	∟UEENEEG111A Carry out basic repairs to electrical components and equipment	
UEENEEG165A	Maintain and service traction lifts systems and equipment	40
	∟UEENEEE101A Apply Occupational, Health and Safety regulations, codes and practices in the workplace	
	∟UEENEEE102A Fabricate, dismantle, assemble of utilities components	
	∟UEENEEE104A Solve problems in D.C circuits	
	∟UEENEEE105A Fix and secure electrotechnology equipment	
	∟UEENEEE107A Use drawings, diagrams, schedules, standards, codes and specifications	
	∟UEENEEG006A Solve problems in single and three phase low voltage machines	
	∟UEENEEG033A Solve problems in single and three phase electrical apparatus and circuits	
	∟UEENEEG063A Arrange circuits, control and protection for general electrical installations	
	∟UEENEEG101A Solve problems in electromagnetic devices and related circuits	
	∟UEENEEG102A Solve problems in low voltage A.C. circuit	
	∟UEENEEG106A Terminate cables, cords and accessories for low voltage circuits	

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	∟UEENEEG108A Troubleshoot and repair faults in low voltage electrical apparatus and circuits	
	∟UEENEEG116A Diagnose and rectify faults in traction lift systems	
UEENEEH102A	Repair basic electronic apparatus faults by replacement of components	40
	∟UEENEEE101A Apply Occupational, Health and Safety regulations, codes and practices in the workplace	
	∟UEENEEE102A Fabricate, dismantle, assemble of utilities industry components	
UEENEEH111A	Troubleshoot single phase input D.C. power supplies	40
	∟UEENEEE101A Apply Occupational, Health and Safety regulations, codes and practices in the workplace	
	∟UEENEEE104A Solve problems in D.C. circuits	
	∟UEENEEH102A Repair basic electronic apparatus faults by replacement of components	
	∟UEENEEH114A Troubleshoot resonance circuits in an electronic apparatus	
	∟UEENEEE119A Solve problems in multiple path extra low voltage (ELV) A.C. circuits	
	∟UEENEEH169A Solve problems in basic electronic circuits	
	∟UEENEEG101A Solve problems in electromagnetic devices and related circuits	
	∟UEENEEG102A Solve problems in low voltage A.C. circuits	
UEENEEI101A	Use instrumentation drawings, specifications, standards and equipment manuals	40
	∟UEENEEE101A Apply Work, Health Safety regulations, codes and practices in the workplace`	
	∟UEENEEE107A Use drawings, diagrams, schedules, standards, codes and specifications	
UEENEEK142A	Apply environmentally and sustainable procedures in the energy sector	20
UETTDRIS44A	Perform H.V. field switching operation to a given schedule	40
	∟UEENEEE101A Apply Occupational, Health and	

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Safety regulations, codes and practices in the workplace

∟UEENEEE102A Fabricate, assemble and dismantle utilities industry components

∟UEENEEE104A Solve problems in D.C. circuits

∟UEENEEE105A Fix and secure electrotechnology equipment

∟UEENEEE107A Use drawings, diagrams, schedules, standards, codes and specifications

∟UEENEEG101A Solve problems in electromagnetic devices and related circuits

∟UEENEEG102A Solve problems in low voltage A.C. Circuits

∟UETTDREL16A Working safely near live electrical apparatus

Transmission Overhead Pathway Group

∟UETTDREL11A Apply sustainable energy and environmental procedures

∟UETTDREL12A Operate plant and equipment near live electrical conductors and apparatus

∟UETTDRIS54A Install and maintain poles, structures and overhead conductors and cables

∟UETTDRTP26A Install transmission structures and associated hardware

∟UETTDRTP27A Maintain transmission structures and associated hardware

∟UETTDRTP29A Install and maintain transmission overhead conductors and cables

Distribution Overhead Pathway Group

∟UETTDREL11A Apply sustainable energy and environmental procedures

∟UETTDRDP12A Maintain overhead energised low voltage conductors and cables

∟UETTDREL12A Operate plant and equipment near live electrical conductors and apparatus

∟UETTDRIS41A Install network infrastructure electrical equipment

∟UETTDRIS42A Maintain network infrastructure electrical equipment

∟UETTDRIS52A Install and maintain poles, structures

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and associated hardware

∟UETTDRIS54A Install and maintain poles, structures and overhead conductors and cables

∟UETTDRIS56AInstall and maintain low voltage overhead services

Rail Traction Pathway Group

∟UETTDREL11A Apply sustainable energy and environmental procedures

∟UETTDREL12A Operate plant and equipment near live electrical conductors and apparatus

∟UETTDRIS52A Install and maintain poles, structures and associated hardware

∟UETTDRIS54A Install and maintain poles, structures and overhead conductors and cables

∟UETTDRRT21A Install traction overhead wiring systems

∟UETTDRRT22A Maintain traction overhead wiring systems

∟UETTDRRT23A Install rail traction bonds

∟UETTDRRT27A Install overhead traction components and equipment

∟UETTDRRT28A Maintain overhead traction components and equipment

Distribution Cable Jointing Pathway Group

∟UETTDRCJ21A Lay ESI electrical cables

∟UETTDRCJ26A Install and maintain deenergised low voltage underground polymeric cables.

∟UETTDRCJ27A Install and maintain deenergised high voltage underground polymeric cables.

∟UETTDREL11A Apply sustainable energy and environmental procedures

∟UETTDREL12A Operate plant and equipment near live electrical conductors and apparatus

∟UETTDRIS41A Install network infrastructure electrical equipment

∟UETTDRIS42A Maintain network infrastructure electrical equipment

∟UETTDRIS55A Install and maintain low voltage underground services

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	Electrical Pathway Group	
	∟UEENEEE137A Document and apply measures to control OHS risks associated with electrotechnology work	
	∟UEENEEG006A Solve problems in single and three phase low voltage machines	
	∟UEENEEG033A Solve problems in single and three phase electrical apparatus and circuits	
	∟UEENEEG063A Arrange circuits, control and protection for general electrical installations	
	∟UEENEEG106A Terminate cables, cords and accessories for low voltage circuits	
	∟UEENEEG108A Troubleshoot and repair faults in low voltage electrical apparatus and circuits	
	∟UEENEEG109A Develop and connect electrical control circuits	
	∟UEENEEK142A Apply environmentally and sustainable energy procedures in the energy sector	
	∟UETTDRIS67A Solve problems in energy supply network equipment	
UETTDREL16A	Working safely near live electrical apparatus	20
UEPOPS301	Conduct single energy source isolation procedures for permit to work	40
UEPOPS349	Operate local H.V. switchgear	40
UEPMNT369	Monitor climatic conditions for renewable electricity generation	40
UEPMNT370	Maintain and monitor wind farm civil assets	40
	∟UEENEEK142A Apply environmental and sustainable procedures in the energy sector	
	∟UEENEEE102A Fabricate, assemble and dismantle utilities industry components	

Group C elective units		**Weighting points**
UEPMNT442	Maintain wind turbine generator electrical systems	60
	∟UEPMNT371 Maintain large scale wind turbine generators	

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	∟UEENEEG006A Solve problems in single and three phase low voltage machines	
	∟UEENEEE102A Fabricate, dismantle, assemble of electrotechnology components	
	∟UEENEEE104A Solve problems in D.C circuits	
	∟UEENEEE105A Fix and secure electrotechnology equipment	
	∟UEENEEE107A Use drawings, diagrams, schedules, standards, codes and specifications	
	∟UEENEEG101ASolve problems in electromagnetic devices and related circuits	
	∟UEENEEG102A Solve problems in low voltage A.C. circuit	
	∟UEENEEG106A Terminate cables, cords and accessories for low voltage circuits	
UEPMNT443	Maintain wind turbine generator control systems	60
	∟UEPMNT371 Maintain large scale wind turbine generators	
UEPMNT444	Maintain wind turbine generator mechanical systems	60
	∟UEPMNT371 Maintain large scale wind turbine generators	
UEPMNT445	Diagnose and repair faults in large scale wind turbine generators	60
	∟UEPMNT371 Maintain large scale wind turbines generators	
	∟UEENEEG108A Troubleshoot and repair faults in low voltage electrical apparatus and circuits	
	∟UEENEEE102A Fabricate, dismantle, assemble of utilities industry components	
	∟UEENEEE104A Solve problems in D.C. circuits	
	∟UEENEEE105A Fix and secure electrotechnology equipment	
	∟UEENEEE107A Use drawings, diagrams, schedules, standards, codes and specifications	
	∟UEENEEG006A Solve problems in single and three phase low voltage machines	
	∟UEENEEG033A Solve problems in single and three phase low voltage electrical apparatus and circuits	

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	∟UEENEEG063A Arrange circuits, control and protection for general electrical installations	
	∟UEENEEG101ASolve problems in electromagnetic devices and related circuits	
	∟UEENEEG102A Solve problems in low voltage A.C. circuits	
	∟UEENEEG106A Terminate cables, cords and accessories for low voltage circuits	
UEPMNT446	Coordinate maintenance on a wind farm	60
	∟UEPMNT445 Diagnose and repair faults in large scale wind turbine generators	
	∟UEPMNT448 Diagnose and repair faults in wind turbine generator control systems	
	∟UEPMNT449 Diagnose and repair faults in wind turbine generator mechanical systems	
	∟UEPMNT371 Maintain large scale wind turbines generators	
	∟UEENEEG108A Troubleshoot and repair faults in low voltage electrical apparatus and circuits	
	∟UEENEEE102A Fabricate, dismantle, assemble of utilities industry components	
	∟UEENEEE104A Solve problems in D.C. circuits	
	∟UEENEEE105A Fix and secure electrotechnology equipment	
	∟UEENEEG107 Use drawings, diagrams, schedules, standards, cords and specifications	
	∟UEENEEG006A Solve problems in single and three phase low voltage machines	
	∟UEENEEG033A Solve problems in single and three phase low voltage electrical apparatus and circuits	
	∟UEENEEG063A Arrange circuits, control and protection for general electrical installations	
	∟UEENEEG101A Solve problems in electromagnetic devices and related circuits	
	∟UEENEEG102A Solve problems in low voltage A.C. circuits	
	∟UEENEEG106A Terminate cables, cords and accessories for low voltage circuits	
	∟UEPMNT443 Maintain wind turbine generator	

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	control systems ∟UEENEEE107A Use drawings, diagrams, schedules, standards, cords and specifications ∟UEPMNT444 Maintain wind turbine generator mechanical systems	
UEPMNT447	Diagnose and repair faults in wind turbine generator electrical systems ∟UEPMNT371 Maintain large scale wind turbine generators ∟UEPMNT442 Maintain wind turbine generator electrical systems ∟UEPMNT445 Diagnose and repair faults in large scale wind turbine generators UEENEEE102A Fabricate, dismantle, assemble of electrotechnology components ∟UEENEEE104A Solve problems in D.C circuits ∟UEENEEE105A Fix and secure electrotechnology equipment ∟UEENEEE107A Use drawings, diagrams, schedules, standards, codes and specifications ∟UEENEEG006A Solve problems in single and three phase low voltage machines ∟UEENEEG033A Solve problems in single and three phase low voltage electrical apparatus and circuits ∟UEENEEG063A Arrange circuits, control and protection for general electrical installations ∟UEENEEG101ASolve problems in electromagnetic devices and related circuits ∟UEENEEG102A Solve problems in low voltage A.C. circuits ∟UEENEEG106A Terminate cables, cords and accessories for low voltage circuits ∟UEENEEG108A Troubleshoot and repair faults in low voltage electrical apparatus and circuits	60
UEPMNT448	Diagnose and repair faults in wind turbine generator control systems ∟UEPMNT371 Maintain large scale wind turbine generators ∟UEPMNT443 Maintain wind turbine generator	60

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	control systems	
	∟UEPMNT445 Diagnose and repair faults in large scale wind turbine generators	
	∟UEENEEG108A Troubleshoot and repair faults in low voltage electrical apparatus and circuits	
	∟UEENEEE102A Fabricate, dismantle, assemble of utilities industry components	
	∟UEENEEE104A Solve problems in D.C. circuits	
	∟UEENEEE105A Fix and secure electrotechnology equipment	
	∟UEENEEE107A Use drawings, diagrams, schedules, standards, codes and specifications	
	∟UEENEEG006A Solve problems in single and three phase low voltage machines	
	∟UEENEEG033A Solve problems in single and three phase low voltage electrical apparatus and circuits	
	∟UEENEEG063A Arrange circuits, control and protection for general electrical installations	
	∟UEENEEG101A Solve problems in electromagnetic devices and related circuits	
	∟UEENEEG102A Solve problems in low voltage A.C. circuits	
	∟UEENEEG106A Terminate cables, cords and accessories for low voltage circuit	
UEPMNT449	Diagnose and repair mechanical systems faults in wind turbine generators	60
	∟UEPMNT371 Maintain large scale wind turbines generators	
	∟UEPMNT444 Maintain wind turbine generator mechanical systems	
	∟UEPMNT445 Diagnose and repair faults in large scale wind turbine generators	
	∟UEENEEG108A Troubleshoot and repair faults in low voltage electrical apparatus and circuits	
	∟UEENEEE102A Fabricate, dismantle, assemble of utilities industry components	
	∟UEENEEE104A Solve problems in D.C. circuits	
	∟UEENEEE105A Fix and secure electrotechnology equipment	

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	∟UEENEEE107A Use drawings, diagrams, schedules, standards, codes and specifications	
	∟UEENEEG006A Solve problems in single and three phase low voltage machines	
	∟UEENEEG033A Solve problems in single and three phase low voltage electrical apparatus and circuits	
	∟UEENEEG063A Arrange circuits, control and protection for general electrical installations	
	∟UEENEEG101A Solve problems in electromagnetic devices and related circuits	
	∟UEENEEG102A Solve problems in low voltage A.C. circuits	
	∟UEENEEG106A Terminate cables, cords and accessories for low voltage circuits	
UEPMNT450	Test and commission wind turbine generators	60
	∟UEPMNT371 Maintain large scale wind turbine generators	
	∟UEPMNT444 Maintain wind turbine generator mechanical systems	
	∟UEPMNT443 Maintain wind turbine generator control systems	
	∟UEPMNT448 Diagnose and repair faults in wind turbine generator control systems	
	∟UEPMNT449 Diagnose and repair mechanical systems faults in wind turbine generators	
	∟UEPMNT445 Diagnose and repair faults in large scale wind turbine generators	
	∟UEENEEG108A Troubleshoot and repair faults in low voltage electrical apparatus and circuits	
	∟UEENEEE102A Fabricate, dismantle, assemble of utilities industry components	
	∟UEENEEE104A Solve problems in D.C. circuits	
	∟UEENEEE105A Fix and secure electrotechnology equipment	
	∟UEENEEE107A Use drawings, diagrams, schedules, standards, codes and specifications	
	∟UEENEEG006A Solve problems in single and three phase low voltage machines	
	∟UEENEEG033A Solve problems in single and three	

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	phase low voltage electrical apparatus and circuits ∟UEENEEG063A Arrange circuits, control and protection for general electrical installations ∟UEENEEG101A Solve problems in electromagnetic devices and related circuits ∟UEENEEG102A Solve problems in low voltage A.C. circuits ∟UEENEEG106A Terminate cables, cords and accessories for low voltage circuits	
UEPOPS402	Conduct multiple energy source isolation procedures for permit to work ∟UEPOPS301 Conduct single energy source isolation procedures for permit to work.	40
UEPOPS424	Coordinate local H.V. networks	30
UEPOPS428	Develop H.V. switching programs	20
UEPOPS456	Perform switching to a switching program	30

Qualification Mapping Information

This qualification replaces and is equivalent to UEP40612 Certificate IV in Large Scale Wind Generation - Electrical

Links

Companion Volume implementation guides are found in VETNet - https://vetnet.gov.au/Pages/TrainingDocs.aspx?q=1715b9fa-e7bd-441c-bb8d-cf22c9c825a8

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UEP50118 Diploma of ESI Generation - Systems Operations

Modification History

Release 2. This is the second release of this qualification in the Electricity Supply Industry - Generation Sector Training Package. The following modification has been made:

- UEPOPS210 Conduct first response within a workplace team and UEPOPS334 Operate and monitor a wind generator deleted due to zero enrolment.

Release 1. This is the first release of this qualification in the UEP - Electricity Supply Industry - Generation Sector Training Package.

Qualification Description

Participants gaining this qualification will be able to perform systems operations functions in the electrical supply industry. Functions may include the remote operation of network systems, the isolating of power generation plant systems for work, the development of operational procedures and systems, the start-up and shut down of boilers and turbines, the oversight of hydro plant and gas turbines and the implementation of safe working practices. It may also include the management of others and the coordination of work activities.

No licensing, legislative or certification requirements apply to this qualification at the time of publication.

Entry Requirements

There are no entry requirements for this qualification.

Packaging Rules

A total 1600 weighting points comprising 640 core weighting points, plus 960 elective weighting points from the general elective units listed below.

Choose a total of 960 weighting points from the elective unit list below of which between 0 and 270 weighting points can be taken from Group A. A total of 660 weighting points may be taken from Group B. A total of 100 weighting points may be selected from Group C. Between 200 and 920 weighting points may be selected from Group D. At least 200 weighting points must be selected from Group D.

Up to 220 weighting points of the general elective units Group A, may be selected, with appropriate contextualisation, from any relevant nationally endorsed Training Package or accredited course, provided that selected units contribute to the vocational outcome of the qualification. Previously assigned weighting points are listed in UEP CVIG, if not listed weighting points will be 10 points unless directed from the ESI Generation Industry Reference Committee (IRC). The general elective units must contribute to the vocational outcomes of the

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qualification.

Where imported units are selected, care must be taken to ensure that all prerequisite units specified are complied with.

Where a prerequisite unit is attached to a unit, it is identified by this symbol ∟.

Core units		**Weighting points**
UEENEEE117A	Implement and monitor energy sector OHS policies and procedures	20
UEENEEE101A	Apply Occupational, Health and Safety regulations, codes and practices in the workplace	20
UEPOPS202	Apply quality systems to work	20
UEPOPS337	Maintain quality systems within the team ∟UEPOPS202 Apply quality systems to work	20
UEPOPS369	Respond to a critical incident	40
UEPOPS370	Facilitate the use of contingency plans for power generation facilities	60
UEPOPS417	Monitor and implement environmental site plans and procedures	20
UEPOPS420	Coordinate network/system	40
UEPOPS426	Interpret and analyse multi-operation protection devices ∟UEPOPS342 Analyse single protection device operation	40
UEPOPS342	Interpret and analyse single operation protection devices	60
UEPOPS428	Develop H.V. switching programs	20
UEPOPS440	Coordinate team activities	30
UEPOPS441	Operate and monitor system equipment	30
UEPOPS454	Coordinate response to critical incidents ∟UEPOPS369 Respond to a critical incident	30
UEPOPS456	Perform switching to a switching program	30
UEPOPS501	Manage Work, Health and Safety policy and procedures ∟UEENEEE117A Implement and monitor energy	40

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	sector OHS policies and procedures	
UEPOPS512	Manage high voltage network system ∟UEPOPS420 Coordinate network/system	80
UEPOPS513	Manage operational crisis to maintain or restore power system integrity	60
UEPOPS515	Coordinate power generation	40

Group A elective units		**Weighting points**
BSBCUS501	Manage quality customer service	40
BSBINM501	Manage an information or knowledge management system	50
BSBINN502	Build and sustain an innovative work environment	50
BSBLED501	Develop a workplace learning environment	60
BSBMGT502	Manage people performance	70
BSBMGT517	Manage operational plan	60
BSBMGT516	Facilitate continuous improvement	60
BSBWHS501	Ensure a safe workplace	60
BSBWOR501	Manage personal work priorities and professional development	60
BSBWOR502	Lead and manage team effectiveness	60

Group B elective units		**Weighting points**
UEPOPS301	Conduct single energy source isolation procedures for permit to work	40
UEPOPS309	Operate and monitor air conditioning plant and ventilation systems	20
UEPOPS310	Operate bulk coal handling plant	40
UEPOPS311	Operate fabric filter dust collection plant	20
UEPOPS312	Operate and monitor fuel supply	20
UEPOPS313	Operate and monitor boiler draught system	40

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UEPOPS314	Operate and monitor fuel firing plant (gas or oil)	40
UEPOPS315	Operate and monitor fuel firing plant (coal)	40
UEPOPS316	Operate and monitor boiler steam/water cycle	40
UEPOPS317	Operate and monitor fixed fire protection systems	30
UEPOPS318	Operate and monitor compressed gas systems	30
UEPOPS319	Operate and monitor gas production plant	30
UEPOPS320	Operate and monitor compressed air systems	30
UEPOPS321	Operate and monitor water treatment plant	30
UEPOPS322	Operate and monitor alkalinity reduction plant	30
UEPOPS323	Operate and monitor reverse osmosis plant	30
UEPOPS324	Operate and monitor brine concentrator plant	30
UEPOPS325	Operate and monitor water quality monitoring systems	30
UEPOPS326	Operate and monitor oil systems	30
UEPOPS327	Monitor and maintain civil assets	30
UEPOPS328	Undertake dam safety surveillance	30
UEPOPS329	Operate and monitor auxiliary steam systems	40
UEPOPS330	Operate and monitor heat exchangers and cooling systems	40
UEPOPS331	Operate and monitor water systems (condensate and feedwater)	40
UEPOPS332	Operate and monitor condenser and auxiliary cooling systems	40
UEPOPS333	Operate and monitor HRSG hot gas control system	40
UEPOPS335	Operate a hydro generator synchronous condenser pump unit	60
UEPOPS336	Manage, operate and monitor a gas turbine unit	60
UEPOPS338	Facilitate workplace communication	20

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UEPOPS339	Operate and monitor a boiler unit	60
UEPOPS340	Operate and monitor a steam turbine	60
UEPOPS342	Analyse single protection device operation	60
UEPOPS343	Operate hydroelectric generating plant and auxiliary equipment	60
UEPOPS344	Conduct water conveyance and control	30
UEPOPS345	Implement dam safety surveillance procedures	30
UEPOPS346	Conduct non-routine operational testing	60
UEPOPS347	Operate and monitor supervisory, control and data acquisition systems	40
UEPOPS349	Operate local H.V. switchgear	40
UEPOPS351	Operate H.V. condition changing apparatus	60
UEPOPS352	Conduct operational checks on in-service mechanical plant	40
UEPOPS354	Operate and monitor dual fuel firing plant	80
UEPOPS355	Monitor the implementation of under frequency load shedding	60
UEPOPS356	Apply environmental and sustainable energy procedures	20
UEPOPS357	Operate local L.V. switchgear	40
UEPOPS358	Monitor and maintain wind farm civil assets	40
UEPOPS359	Monitor climatic conditions for renewable energy production	40
UEPOPS360	Operate and monitor a hydro turbine	60
UEPOPS361	Operate and monitor hydro plant auxiliary systems	60
UEPOPS362	Operate and monitor generator/alternator	60
UEPOPS364	Ensure compliance with Work, Health and Safety policy and procedures	20
UEPOPS368	Operate manual systems	30
	∟ UEPOPS252 Undertake local systems operations	

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UEPOPS371	Carry out operational checks on in-service electrical plant	40

Group C elective units		**Weighting points**
UEENEEC005B	Estimate electrotechnology projects	40
UEPOPS402	Conduct multiple energy source isolation procedures for permit to work	40
	∟UEPOPS301 Conduct single energy source isolation procedures for permit to work	
UEPOPS403	Coordinate permit to work system	40
	∟UEPOPS402 Conduct multiple energy source isolation procedures for permit to work	
UEPOPS404	Coordinate first response team operation	20
UEPOPS405	Operate and monitor A.C. electrical systems	30
UEPOPS406	Operate and monitor D.C. electrical systems	30
UEPOPS407	Start and run up gas turbine	60
UEPOPS408	Shut down a gas turbine	60
UEPOPS409	Start up a boiler unit	60
UEPOPS410	Shut down a boiler unit	60
UEPOPS411	Run up a steam turbine	60
UEPOPS412	Undertake commissioning and decommissioning	30
UEPOPS413	Coordinate operational strategies for power production	20
UEPOPS414	Perform risk analysis of generation plant	20
UEPOPS416	Monitor implementation of quality control for production and maintenance	20
	∟UEPOPS337 Maintain quality systems within the team	
UEPOPS419	Shut down a steam turbine	60
UEPOPS422	Schedule generation	40
UEPOPS423	Plan a scheduled outage	40

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UEPOPS424	Coordinate local H.V. networks	40
UEPOPS425	Produce maintenance plans for generation production plant	40
UEPOPS430	Control permit to work operations	30
UEPOPS431	Collect and analyse hydrological and meteorological data	20
	∟UEPOPS209 Perform process plant inspections	
UEPOPS432	Start up a heat recovery steam generator unit	30
	∟UEPOPS209 Perform process plant inspections	
UEPOPS433	Operate and monitor a heat recovery steam generator unit	20
	∟UEPOPS333 Operate and monitor HRSG hot gas control system	
	∟UEPOPS407 Start and run up gas turbine	
	∟UEPOPS433 Start up a heat recovery steam generator unit	
UEPOPS434	Shut down a heat recovery steam generator unit	30
	∟UEPOPS333 Operate and monitor HRSG hot gas control system	
	∟UEPOPS408 Shut down a gas turbine	
UEPOPS435	Operate and monitor flue gas (NOx) mitigation systems	30
UEPOPS437	Manage system restart	40
UEPOPS439	Plan and organise work	30
UEPOPS442	Monitor and coordinate the operation of a combined cycle gas turbine unit	60
	∟UEPOPS314 Operate and monitor fuel firing plant (gas or oil)	
	∟UEPOPS333 Operate and monitor HRSG hot gas control system	
	∟UEPOPS336 Operate and monitor gas turbine unit ∟UEPOPS340 Operate and monitor a steam turbine	
UEPOPS443	Coordinate wind farm operations	40
UEPOPS444	Start and run up a hydro turbine	60

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UEPOPS445	Shut down a hydro turbine	60
UEPOPS446	Operate and monitor hydro unit control and protection systems	80
UEPOPS447	Coordinate photovoltaic solar power plant operations	60
UEPOPS450	Coordinate workplace communication ∟UEPOPS338 Facilitate workplace communication	40
UEPOPS451	Coordinate the use of contingency plans ∟UEPOPS370 Facilitate the use of contingency plans for power generation facilities	40
UEPOPS452	Conduct operational checks and carry out corrective action on in-service electrical plant	40
UEPOPS457	Control electrical energy production	40

Group D elective units		**Weighting points**
UEPOPS502	Manage permit to work system ∟UEPOPS403 Coordinate permit to work system ∟UEPOPS402 Conduct multiple energy source isolation procedures for permit to work	40
UEPOPS505	Produce maintenance strategies for generation production plant ∟UEPOPS425 Produce maintenance plans for generation production plant.	80
UEPOPS507	Conduct project management	60
UEPOPS508	Manage commissioning and decommissioning	80
UEPOPS509	Manage quality control procedures	40
UEPOPS510	Monitor power generation plant reliability	60
UEPOPS511	Tune process plant and equipment	60
UEPOPS514	Control hydro generation pumping	60
UEPOPS520	Evaluate cost estimations and initiate appropriate solutions ∟UEENEEC005B Estimate electrotechnology projects	40

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UEPOPS523	Manage critical incidents	60
	∟UEPOPS369 Respond to a critical incident	
	∟UEPOPS454 Coordinate response to critical incidents	
UEPOPS524	Evaluate scheduling of generation plant	60
	∟UEPOPS422 Schedule generation	
UEPOPS525	Coordinate and direct switching program	60
	∟UEPOPS456 Perform switching to a switching program	
UEPOPS526	Coordinate electrical energy production	60
	∟UEPOPS457 Control electrical energy production	
UEPOPS527	Manage first response team	40
	∟UEPOPS404 Coordinate first response team operation	
UEPOPS528	Manage environmental management systems	40
UEPOPS529	Manage operational strategies for power production	80

Qualification Mapping Information

This qualification replaces and is equivalent to UEP50112 Diploma of ESI Generation - Systems Operations

Links

Companion Volume implementation guides are found in VETNet - https://vetnet.gov.au/Pages/TrainingDocs.aspx?q=1715b9fa-e7bd-441c-bb8d-cf22c9c825a8

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UEP50218 Diploma of ESI Generation - Operations

Modification History

Release 2. This is the second release of this qualification in the Electricity Supply Industry - Generation Sector Training Package. The following modification has been made:

- UEPOPS210 Conduct first response within a workplace team and UEPOPS334 Operate and monitor a wind generator deleted due to zero enrolment.

Release 1. This is the first release of this qualification in the UEP - Electricity Supply Industry - Generation Sector Training Package.

Qualification Description

Participants gaining this qualification will be able to perform operations functions in the electrical supply industry. Functions may include the remote operation of network systems, the isolating of power generation plant systems for work, the development of operational procedures and systems, the start-up and shut down of boilers and turbines, the oversight of hydro plant and gas turbines and the implementation of safe working practices. It may also include the management of others and the coordination of work activities.

No licensing, legislative or certification requirements apply to this qualification at the time of publication.

Entry Requirements

There are no entry requirements for this qualification.

Packaging Rules

A **total** 1600 weighting points comprising 690 core weighting points, plus 910 elective weighting points from the general elective units listed below.

Choose a total of 910 weighting points from the general elective unit list below of which between 0 and 270 weighting points can be taken from Group A. A total of 490 weighting points may be taken from Group B. A total of 180 weighting points may be selected from Group C. Between 240 and 910 weighting points may be selected from Group D, at least 240 weighting points must be selected from Group D. You may select all your elective units from this group.

Up to 270 weighting points of the general elective units Group A, may be selected, with appropriate contextualisation, from any relevant nationally endorsed Training Package or accredited course, provided that selected units contribute to the vocational outcome of the qualification. Previously assigned weighting points are listed in UEP CVIG, if not listed weighting points will be 10 points unless directed from the ESI Generation Industry Reference Committee (IRC). The general elective units must contribute to the vocational outcomes of the

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qualification.

Where imported units are selected, care must be taken to ensure that all prerequisite units specified are complied with.

Where a prerequisite unit is attached to a unit, it is identified by this symbol ∟.

Core units		**Weighting points**
UEENEEE117A	Implement and monitor energy sector OHS policies and procedures	20
UEENEEE101A	Apply Occupational, Health and Safety regulations, codes and practices in the workplace	20
UEPOPS202	Apply quality systems to work	20
UEPOPS337	Maintain quality systems within the team ∟UEPOPS202 Apply quality systems to work	20
UEPOPS301	Conduct single energy source isolation procedures for permit to work	40
UEPOPS402	Conduct multiple energy source isolation procedures for permit to work ∟UEPOPS301 Conduct single energy source isolation procedures for permit to work	40
UEPOPS403	Coordinate permit to work system ∟UEPOPS402 Conduct multiple energy source isolation procedures for permit to work	40
UEPOPS405	Operate and monitor A.C. electrical systems	30
UEPOPS406	Operate and monitor D.C. electrical systems	30
UEPOPS417	Monitor and implement environmental site plans and procedures	20
UEPOPS342	Analyse single protection device operation	60
UEPOPS426	Interpret and analyse multi-operation protection devices ∟UEPOPS342 Analyse single protection device operation	40
UEPOPS439	Plan and organise work	30

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UEPOPS440	Coordinate team activities	30
UEPOPS454	Coordinate response to critical incidents ∟UEPOPS369 Respond to a critical incident	30
UEPOPS369	Respond to a critical incident	40
UEPOPS457	Control electrical energy production	40
UEPOPS501	Manage Work, Health and Safety policy and procedures ∟UEENEEE117A Implement and monitor energy sector OHS policies and procedures	40
UEPOPS502	Manage permit to work system ∟UEPOPS403 Coordinate permit to work system ∟UEPOPS402 Conduct multiple energy source isolation procedures for permit to work	40
UEPOPS509	Manage quality control procedures	40
UEPOPS513	Manage operational crisis to maintain or restore power system integrity	60

Group A elective units		**Weighting points**
BSBCUS501	Manage quality customer service	40
BSBINM501	Manage an information or knowledge management system	50
BSBINN502	Build and sustain an innovative work environment	50
BSBLED501	Develop a workplace learning environment	60
BSBMGT502	Manage people performance	70
BSBMGT517	Manage operational plan	60
BSBMGT516	Facilitate continuous improvement	60
BSBWHS501	Ensure a safe workplace	60
BSBWOR501	Manage personal work priorities and professional development	60

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BSBWOR502	Lead and manage team effectiveness	60
LGAWORK404A	Manage a civil works project	80

Group B elective units		**Weighting points**
UEPOPS309	Operate and monitor air conditioning plant and ventilation systems	20
UEPOPS310	Operate bulk coal handling plant	40
UEPOPS311	Operate fabric filter dust collection plant	20
UEPOPS312	Operate and monitor fuel supply	20
UEPOPS313	Operate and monitor boiler draught system	40
UEPOPS314	Operate and monitor fuel firing plant (gas or oil)	40
UEPOPS315	Operate and monitor fuel firing plant (coal)	40
UEPOPS316	Operate and monitor boiler steam/water cycle	40
UEPOPS317	Operate and monitor fixed fire protection systems	30
UEPOPS318	Operate and monitor compressed gas systems	30
UEPOPS319	Operate and monitor gas production plant	30
UEPOPS320	Operate and monitor compressed air systems	30
UEPOPS321	Operate and monitor water treatment plant	30
UEPOPS322	Operate and monitor alkalinity reduction plant	30
UEPOPS323	Operate and monitor reverse osmosis plant	30
UEPOPS324	Operate and monitor brine concentrator plant	30
UEPOPS325	Operate and monitor water quality monitoring systems	30
UEPOPS326	Operate and monitor oil systems	30

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UEPOPS327	Monitor and maintain civil assets	30
UEPOPS328	Undertake dam safety surveillance	30
UEPOPS329	Operate and monitor auxiliary steam systems	40
UEPOPS330	Operate and monitor heat exchangers and cooling systems	40
UEPOPS331	Operate and monitor water systems (condensate and feedwater)	40
UEPOPS332	Operate and monitor condenser and auxiliary cooling systems	40
UEPOPS333	Operate and monitor HRSG hot gas control system	40
UEPOPS335	Operate a hydro generator synchronous condenser pump unit	60
UEPOPS336	Manage, operate and monitor a gas turbine unit	60
UEPOPS338	Facilitate workplace communication	20
UEPOPS339	Operate and monitor a boiler unit	60
UEPOPS340	Operate and monitor a steam turbine	60
UEPOPS343	Operate hydroelectric generating plant and auxiliary equipment	60
UEPOPS344	Conduct water conveyance and control	30
UEPOPS345	Implement dam safety surveillance procedures	30
UEPOPS346	Conduct non-routine operational testing	60
UEPOPS347	Operate and monitor supervisory, control and data acquisition systems	40
UEPOPS349	Operate local H.V. switchgear	40
UEPOPS351	Operate H.V. condition changing apparatus	60
UEPOPS352	Conduct operational checks on in-service mechanical plant	40

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UEPOPS354	Operate and monitor dual fuel firing plant	80
UEPOPS355	Monitor the implementation of under frequency load shedding	60
UEPOPS356	Apply environmental and sustainable energy procedures	20
UEPOPS357	Operate local L.V. switchgear	40
UEPOPS358	Monitor and maintain wind farm civil assets	40
UEPOPS359	Monitor climatic conditions for renewable energy production	40
UEPOPS360	Operate and monitor a hydro turbine	60
UEPOPS361	Operate and monitor hydro plant auxiliary systems	60
UEPOPS362	Operate and monitor generator/alternator	60
UEPOPS364	Ensure compliance with Work, Health and Safety policy and procedures	20
UEPOPS368	Operate manual systems ∟UEPOPS252 Undertake local systems operations	30
UEPOPS369	Respond to a critical incident	40
UEPOPS370	Facilitate the use of contingency plans for power generation facilities	60
UEPOPS371	Carry out operational checks on in-service electrical plant	40

Group C elective units		**Weighting points**
UEPOPS404	Coordinate first response team operation	20
UEPOPS407	Start and run up gas turbine	60
UEPOPS408	Shut down a gas turbine	60
UEPOPS409	Start up a boiler unit	60

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UEPOPS410	Shut down a boiler unit	60
UEPOPS411	Run up a steam turbine	60
UEPOPS412	Undertake commissioning and decommissioning	30
UEPOPS413	Coordinate operational strategies for power production	20
UEPOPS414	Perform risk analysis of generation plant	20
UEPOPS416	Monitor implementation of quality control for production and maintenance ∟UEPOPS337 Maintain quality systems within the team	20
UEPOPS419	Shut down a steam turbine	60
UEPOPS420	Coordinate network/system	40
UEPOPS422	Schedule generation	40
UEPOPS423	Plan a scheduled outage	40
UEPOPS424	Coordinate local H.V. networks	40
UEPOPS425	Produce maintenance plans for generation production plant	40
UEPOPS428	Develop H.V. switching programs	40
UEPOPS430	Control permit to work operations	30
UEPOPS431	Collect and analyse hydrological and meteorological data ∟UEPOPS209 Perform process plant inspections	20
UEPOPS432	Start up a heat recovery steam generator unit ∟UEPOPS209 Perform process plant inspections	30
UEPOPS433	Operate and monitor a heat recovery steam generator unit ∟UEPOPS333 Operate and monitor HRSG hot gas control system	20

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	∟UEPOPS407 Start and run up gas turbine	
	∟UEPOPS433 Start up a heat recovery steam generator unit	
UEPOPS434	Shut down a heat recovery steam generator unit	30
	∟UEPOPS333 Operate and monitor HRSG hot gas control system	
	∟UEPOPS408 Shut down a gas turbine	
UEPOPS435	Operate and monitor flue gas (NOx) mitigation systems	30
UEPOPS437	Manage system restart	40
UEPOPS441	Operate and monitor system equipment	30
UEPOPS442	Monitor and coordinate the operation of a combined cycle gas turbine unit	60
	∟UEPOPS314 Operate and monitor fuel firing plant (gas or oil)	
	∟UEPOPS333 Operate and monitor HRSG hot gas control system	
	∟UEPOPS336 Operate and monitor gas turbine unit	
	∟UEPOPS340 Operate and monitor a steam turbine	
UEPOPS443	Coordinate wind farm operations	40
UEPOPS444	Start and run-up a hydro turbine	60
UEPOPS445	Shut down a hydro turbine	60
UEPOPS446	Operate and monitor hydro unit control and protection systems	80
UEPOPS447	Coordinate photovoltaic solar power plant operations	60
UEPOPS450	Coordinate workplace communication	40
	∟UEPOPS338 Facilitate workplace communication	
UEPOPS451	Coordinate the use of contingency plans	40
	∟UEPOPS370 Facilitate the use of contingency plans for power generation facilities	
UEPOPS452	Conduct operational checks and carry out corrective	40

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	action on in-service electrical plant	
UEPOPS456	Perform switching to a switching program	30
UEPOPL001	Licence to operate a steam turbine	60
UEPOPL002	Licence to operate a reciprocating steam engine	60

Group D elective units		**Weighting points**
UEPOPS505	Produce maintenance strategies for generation production plant ∟UEENEEE117A Implement and monitor energy sector OHS policies and procedures	80
UEPOPS507	Conduct project management	60
UEPOPS508	Manage commissioning and decommissioning	80
UEPOPS510	Monitor power generation plant reliability	60
UEPOPS511	Tune process plant and equipment	60
UEPOPS512	Manage high voltage network system ∟UEPOPS420 Coordinate network/system	80
UEPOPS514	Control hydro generation pumping	60
UEPOPS515	Coordinate power generation	40
UEPOPS520	Evaluate cost estimations and initiate appropriate solutions ∟UEENEEC005B Estimate electrotechnology projects	40
UEPOPS523	Manage critical incidents ∟UEPOPS369 Respond to a critical incident ∟UEPOPS454 Coordinate response to critical incidents	60
UEPOPS524	Evaluate scheduling of generation plant ∟UEPOPS422 Schedule generation	60
UEPOPS525	Coordinate and direct switching program ∟UEPOPS456 Perform switching to a switching	60

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	program	
UEPOPS526	Coordinate electrical energy production ∟UEPOPS457 Control electrical energy production	60
UEPOPS527	Manage first response team ∟UEPOPS404 Coordinate first response team operation	40
UEPOPS528	Manage environmental management systems	40
UEPOPS529	Manage operational strategies for power production	80

Qualification Mapping Information

This qualification replaces and is equivalent to UEP50212 Diploma of ESI Generation (Operations)

Links

Companion Volume implementation guides are found in VETNet - https://vetnet.gov.au/Pages/TrainingDocs.aspx?q=1715b9fa-e7bd-441c-bb8d-cf22c9c825a8

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UEP50318 Diploma of ESI Generation (Maintenance)

Modification History

Release 2. This is the second release of this qualification in the Electricity Supply Industry - Generation Sector Training Package. The following modification has been made:

- UEPOPS210 Conduct first response within a workplace team and UEPMNT435 Diagnose and repair faults in wind turbine mechanical systems and UEPMNT406 Install and maintain a steam turbine and UEPMNT311 Maintain fuel transport equipment and UEPMNT313 Maintain internal combustion engines and UEPMNT361 Maintain wind turbine mechanical systems and UEPMNT315 Maintain wind turbines and UEPMNT424 Monitor efficiency of thermal steam cycle power plant and UEPMNT407 Repair a gas turbine unit deleted due to zero enrolment.

Release 1. This is the first release of this qualification in the UEP - Electricity Supply Industry - Generation Sector Training Package.

Qualification Description

Participants gaining this qualification will be able to manage functions in the electrical supply industry. Functions can include the development of maintenance schedules, operational procedures, systems and the implementation of safe working practices. It also includes the management of projects, supervision of others and the coordination of work activities.

No licensing, legislative or certification requirements apply to this qualification at the time of publication.

Entry Requirements

There are no entry requirements for this qualification.

Packaging Rules

A total 1870 weighting points comprising 530 core weighting points, plus 1070 elective weighting points from the general elective units listed below.

Choose a total of 1340 weighting point from the general elective unit list below of which between 0 and 270 weighting points can be taken from Group A. A total of 770 weighting points can be selected from Group B. A total of 120 weighting points can be selected from Group C. Between 180 and 940 weighting points may be taken from Group B, you may select all your elective units from this group.

Up to 270 weighting points of the general elective units Group A may be selected, with appropriate contextualisation, from any relevant nationally endorsed Training Package or accredited course, provided that selected units contribute to the vocational outcome of the

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qualification. Previously assigned weighting points are listed in UEP CVIG, if not listed weighting points will be 10 points unless directed from the ESI Generation Industry Reference Committee (IRC). The general elective units must contribute to the vocational outcomes of the qualification.

Where imported units are selected, care must be taken to ensure that all prerequisite units specified are complied with.

Where a prerequisite unit is attached to a unit, it is identified by this symbol ∟.

Core units		**Weighting points**
MEM09002B	Interpret technical drawing	40
MEM12023A	Perform engineering measurements	50
MEM18001C	Use hand tools	20
MEM18002B	Use power tools/hand held operations	20
UEPMNT421	Conduct technical inspection of process plant and equipment ∟UEPMNT351 Test and commission electrical equipment ∟UEENEEG108A Troubleshoot and repair faults in low voltage electrical apparatus and circuits ∟UEENEEE101A Apply Occupational Health Safety regulations, codes and practices in the workplace ∟UEENEEE102A Fabricate, assemble and dismantle utilities industry components ∟UEENEEE104A Solve problems in D.C. circuits ∟UEENEEE105A Fix and secure electrotechnology equipment ∟UEENEEE107A Use drawings, diagrams, schedules, standards, codes and specifications ∟UEENEEG006A Solve problems in single and three phase low voltage machines ∟UEENEEG033A Solve problems in single and three phase low voltage electrical apparatus and circuits ∟UEENEEG063A Arrange circuits, control and protection for general electrical installations ∟UEENEEG101A Solve problems in electromagnetic devices and related circuits	60

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	∟UEENEEG102A Solve problems in low voltage A.C. circuits	
	∟UEENEEG106A Terminate cables, cords and accessories for low voltage circuit	
UEPMNT351	Test and commission electrical equipment	40
UEENEEG108A	Troubleshoot and repair faults in low voltage electrical apparatus and circuits	40
UEENEEE102A	Fabricate, assemble and dismantle utilities industry components	40
UEENEEE104A	Solve problems in D.C. circuits	80
UEENEEE105A	Fix and secure electrotechnology equipment	20
UEENEEE107A	Use drawings, diagrams, schedules, standards, codes and specifications	40
UEENEEG006A	Solve problems in single and three phase low voltage machines	80
UEENEEG033A	Solve problems in single and three phase low voltage electrical apparatus and circuits	60
UEENEEG063A	Arrange circuits, control and protection for general electrical installations	40
UEENEEG101A	Solve problems in electromagnetic devices and related circuits	60
UEENEEG102A	Solve problems in low voltage A.C. circuits	80
UEENEEG106A	Terminate cables, cords and accessories for low voltage circuit	80
UEENEEE117A	Implement and monitor energy sector OHS policies and procedures	20
UEENEEE101A	Apply Occupational, Health and Safety regulations, codes and practices in the workplace	20
UEPOPS337	Maintain quality systems within the team	20
	∟UEPOPS202 Apply quality systems to work	
UEPOPS202	Apply quality systems to work	20

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UEPOPS338	Facilitate workplace communication	20
UEPOPS416	Monitor implementation of quality control for production and maintenance ∟UEPOPS337 Maintain quality systems within the team	20
UEPOPS417	Monitor and implement environmental site plans and procedures	20
UEPOPS430	Control permit to work operations	20
UEPOPS439	Plan and organise work	30
UEPOPS440	Coordinate team activities	30
UEPOPS501	Manage Work, Health and Safety policy and procedures ∟UEENEEE117A Implement and monitor energy sector OHS policies and procedures	40
UEPOPS505	Produce maintenance strategies for generation production plant ∟UEPOPS425 Produce maintenance plans for generation production plant	40
UEPOPS425	Produce maintenance plans for generation production plant	40
UEPOPS507	Conduct project management	60

Group A elective units		**Weighting points**
BSBCUS501	Manage quality customer service	40
BSBINM501	Manage an information or knowledge management system	50
BSBINN502	Build and sustain an innovative work environment	50
BSBLED501	Develop a workplace learning environment	60
BSBMGT502	Manage people performance	70
BSBMGT517	Manage operational plan	60

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BSBMGT516	Facilitate continuous improvement	60
BSBWHS501	Ensure a safe workplace	60
BSBWOR501	Manage personal work priorities and professional development	60
BSBWOR502	Lead and manage team effectiveness	60

Group B elective units		**Weighting points**
MEM05007C	Perform manual heating and thermal cutting	20
MEM05012C	Perform routine manual metal arc welding	20
MEM05015D	Weld using manual metal arc welding process ∟MEM05012C Perform routine manual metal arc welding ∟MEM05051A Select welding processes ∟MEM05052A Apply safe welding practices ∟MEM12023A Perform engineering measurements ∟MEM18001C Use hand tools ∟MEM18002B Use power tools/hand held operations	40
MEM05017D	Weld using gas metal arc welding process ∟MEM05050B Perform routine gas metal arc welding ∟MEM05051A Select welding processes ∟MEM05052A Apply safe welding practices ∟MEM12023A Perform engineering measurements ∟MEM18001C Use hand tools ∟MEM18002B Use power tools/hand held operation	40
MEM05026C	Apply welding principles	40
MEM05050B	Perform routine gas metal arc welding	20
MEM05051A	Select welding processes	20
MEM05052A	Apply safe welding practices	40

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MEM07005C	Perform general machining	80
	∟ MEM09002B Interpret technical drawing	
	∟ MEM12023A Perform engineering measurements	
	∟ MEM18001C Use hand tools	
MEM07006C	Perform lathe operations	40
	∟ MEM07005C Perform general machining	
	∟ MEM09002B Interpret technical drawing	
	∟ MEM12023A Perform engineering measurements	
	∟ MEM18001C Use hand tools	
MEM07007C	Perform milling operations	40
	∟ MEM07005C Perform general machining	
	∟ MEM09002B Interpret technical drawing	
	∟ MEM12023A Perform engineering measurements	
	∟ MEM18001C Use hand tools	
MEM07008D	Perform grinding operations	40
	∟ MEM07005C Perform general machining	
	∟ MEM09002B Interpret technical drawing	
	∟ MEM12023A Perform engineering measurements	
	∟ MEM18001C Use hand tools	
MEM12003B	Perform precision mechanical measurement	20
	∟ MEM12023A Perform engineering measurements	
MEM12024A	Perform computations	30
MEM18003C	Use tools for precision work	40
	∟ MEM12023A Perform engineering measurements	
	∟ MEM18001C Use hand tools	
	∟ MEM18002B Use power tools/hand held operations	
MEM18006C	Repair and fit engineering components	60
	∟ MEM09002B Interpret technical drawing	
	∟ MEM12023A Perform engineering measurements	
	∟ MEM18001C Use hand tools	
	∟ MEM18002B Use power tools/hand held operations	

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	∟MEM18003C Use tools for precision work	
	∟MEM18055B Dismantle, replace and assemble engineering components	
MEM18007B	Maintain and repair mechanical drives and mechanical transmission assemblies	40
	∟MEM09002B Interpret technical drawing	
	∟MEM12023A Perform engineering measurements	
	∟MEM18001C Use hand tools	
	∟MEM18002B Use power tools/hand held operations	
	∟MEM18003C Use tools for precision work	
	∟MEM18006C Repair and fit engineering components	
	∟MEM18009B Perform levelling and alignment of machines and engineering components	
	∟MEM18055B Dismantle, replace and assemble engineering components	
MEM18009B	Perform levelling and alignment of machines and engineering components	40
	∟MEM09002B Interpret technical drawing	
	∟MEM12023A Perform engineering measurements	
	∟MEM18001C Use hand tools	
	∟MEM18002B Use power tools/hand held operations	
	∟MEM18003C Use tools for precision work	
	∟MEM18006C Repair and fit engineering components	
	∟MEM18055B Dismantle, replace and assemble engineering components	
MEM18010C	Perform equipment condition monitoring and recording	40
	∟MEM09002B Interpret technical drawing	
	∟MEM12023A Perform engineering measurements	
	∟MEM18001C Use hand tools	
	∟MEM18002B Use power tools/hand held operations	
	∟MEM18055B Dismantle, replace and assemble engineering components	
MEM18055B	Dismantle, replace and assemble engineering components	30
	∟MEM09002B Interpret technical drawing	

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	∟MEM12023A Perform engineering measurements	
	∟MEM18001C Use hand tools	
	∟MEM18002B Use power tools/hand held operation	
UEPMNT302	Install and maintain industrial pipe work	40
	∟MEM18006C Repair and fit engineering components	
	∟MEM09002B Interpret technical drawing	
	∟MEM12023A Perform engineering measurements	
	∟MEM18001C Use hand tools	
	∟MEM18002B Use power tools/hand held operations	
	∟MEM18003C Use tools for precision work	
	∟MEM18055B Dismantle, replace and assemble engineering components	
UEPMNT303	Maintain mechanical valves	40
	∟MEM18006C Repair and fit engineering components	
	∟MEM09002B Interpret technical drawing	
	∟MEM12023A Perform engineering measurements	
	∟MEM18001C Use hand tools	
	∟MEM18002B Use power tools/hand held operations	
	∟MEM18003C Use power tools/hand held operations	
	∟MEM18055B Dismantle, replace and assemble engineering components	
UEPMNT304	Maintain mechanical pumps	40
	∟MEM18006C Repair and fit engineering components	
	∟MEM09002B Interpret technical drawing	
	∟MEM12023A Perform engineering measurements	
	∟MEM18001C Use hand tools	
	∟MEM18002B Use power tools/hand held operations	
	∟MEM18003C Use tools for precision work	
	∟MEM18055B Dismantle, replace and assemble engineering component	
UEPMNT305	Maintain industrial fans	40
	∟MEM18006C Repair and fit engineering components	
	∟MEM09002B Interpret technical drawing	

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	∟MEM12023A Perform engineering measurements	
	∟MEM18001C Use hand tools	
	∟MEM18002B Use power tools/hand held operations	
	∟MEM18003C Use tools for precision work	
	∟MEM18055B Dismantle, replace and assemble engineering components	
UEPMNT307	Maintain industrial screens, strainers and filters	20
	∟MEM18006C Repair and fit engineering components	
	∟MEM09002B Interpret technical drawing	
	∟MEM12023A Perform engineering measurements	
	∟MEM18001C Use hand tools	
	∟MEM18002B Use power tools/hand held operations	
	∟MEM18003C Use tools for precision work	
	∟MEM18055B Dismantle, replace and assemble engineering components	
UEPMNT308	Maintain conveyors and associated equipment	40
	∟MEM18006C Repair and fit engineering components	
	∟MEM09002B Interpret technical drawing	
	∟MEM12023A Perform engineering measurements	
	∟MEM18001C Use hand tools	
	∟MEM18002B Use tools for precision work	
	∟MEM18055B Dismantle, replace and assemble engineering components	
UEPMNT309	Maintain material feeders	40
	∟MEM18006C Repair and fit engineering components	
	∟MEM09002B Interpret technical drawing	
	∟MEM12023A Perform engineering measurements	
	∟MEM18001C Use hand tools	
	∟MEM18002B Use power tools/hand held operations	
	∟MEM18003C Use tools for precision work	
	∟MEM18055B Dismantle, replace and assemble engineering components	
UEPMNT310	Maintain material crushers	40

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	∟MEM18006C Repair and fit engineering components	
	∟MEM09002B Interpret technical drawing	
	∟MEM12023A Perform engineering measurements	
	∟MEM18001C Use hand tools	
	∟MEM18002B Use power tools/hand held operations	
	∟MEM18003C Use tools for precision work	
	∟MEM18055B Dismantle, replace and assemble engineering components	
UEPMNT312	Maintain industrial pressure vessels	80
	∟MEM18006C Repair and fit engineering components	
	∟MEM09002B Interpret technical drawing	
	∟MEM12023A Perform engineering measurements	
	∟MEM18001C Use hand tools	
	∟MEM18002B Use power tools/hand held operations	
	∟MEM18003C Use tools for precision work	
	∟MEM18055B Dismantle, replace and assemble engineering component	
UEPMNT314	Maintain hydro turbines	100
UEPMNT317	Diagnose and repair faults in mechanical equipment	40
	∟MEM18006C Repair and fit engineering components	
	∟MEM09002B Interpret technical drawing	
	∟MEM12023A Perform engineering measurements	
	∟MEM18001C Use hand tools	
	∟MEM18002B Use power tools/hand held operations	
	∟MEM18003C Use tools for precision work	
	∟MEM18055B Dismantle, replace and assemble engineering components	
UEPMNT318	Conduct generator mechanical maintenance	80
	∟MEM18006C Repair and fit engineering components	
	∟MEM09002B Interpret technical drawing	
	∟MEM12023A Perform engineering measurements	
	∟MEM18001C Use hand tools	
	∟MEM18002BUse power tools/hand held operations	

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	∟MEM18003C Use tools for precision work	
	∟MEM18055B Dismantle, replace and assemble engineering components	
UEPOPS301	Conduct single energy source isolation procedures for permit to work	40

Group C elective units		**Weighting points**
MEM05016C	Perform advanced welding using manual metal arc welding process	40
	∟MEM05007C Perform manual heating and thermal cutting	
	∟MEM05012C Perform routine manual metal arc welding	
	∟MEM05015D Weld using manual metal arc welding process	
	∟MEM05051A Select welding processes	
	∟MEM05052AApply safe welding practices	
	∟MEM09002B Interpret technical drawing	
	∟MEM12023A Perform engineering measurements	
	∟MEM18001C Use hand tools	
	∟MEM18002B Use power tools/hand held operations	
MEM05018C	Perform advanced welding using gas metal arc welding process	40
	∟MEM05007C Perform manual heating and thermal cutting	
	∟MEM05017D Weld using gas metal arc welding process	
	∟MEM05050B Perform routine gas metal arc welding	
	∟MEM05051A Select welding processes	
	∟MEM05052A Apply safe welding practices	
	∟MEM09002B Interpret technical drawing	
	∟MEM12023A Perform engineering measurements	
	∟MEM18001C Use hand tools	
	∟MEM18002B Use power tools/hand held operations	
MEM05024B	Perform welding supervision	120

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	∟MEM05026C Apply welding principles	
MEM07011B	Perform complex milling operations	40
	∟MEM07005C Perform general machining	
	∟MEM07007C Perform milling operations	
	∟MEM09002B Interpret technical drawing	
	∟MEM12003B Perform precision mechanical measurement	
	∟MEM12023A Perform engineering measurements	
	∟MEM12024A Perform computations	
	∟MEM18001C Use hand tools	
MEM07012B	Perform complex grinding operations	40
	∟MEM07005C Perform general machining	
	∟MEM07008D Perform grinding operations	
	∟MEM09002B Interpret technical drawing	
	∟MEM12003B Perform precision mechanical measurement	
	∟MEM12023A Perform engineering measurements	
	∟MEM18001C Use hand tools	
MEM07021B	Perform complex lathe operations	40
	∟MEM07005C Perform general machining	
	∟MEM07006C Perform lathe operations	
	∟MEM09002B Interpret technical drawing	
	∟MEM12003B Perform precision mechanical measurement	
	∟MEM12023A Perform engineering measurements	
	∟MEM12024A Perform computations	
	∟MEM18001C Use hand tools	
UEPMNT401	Install and maintain complex mechanical seals	40
	∟UEPMNT304 Maintain mechanical pumps	
	∟MEM18006C Repair and fit engineering components	
	∟MEM09002B Interpret technical drawing	
	∟MEM12023A Perform engineering measurements	
	∟MEM18001C Use hand tools	

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	∟MEM18002B Use power tools/hand held operations	
	∟MEM18003C Use tools for precision work	
	∟MEM18055B Dismantle, replace and assemble engineering components	
UEPMNT402	Conduct complex levelling and alignment	40
	∟MEM18009B Perform levelling and alignment of machines and engineering components	
	∟MEM09002B Interpret technical drawing	
	∟MEM12023A Perform engineering measurements	
	∟MEM18001C Use hand tools	
	∟MEM18002B Use power tools/hand held operations	
	∟MEM18003C Use tools for precision work	
	∟MEM18055B Dismantle, replace and assemble engineering components	
	∟ MEM18006C Repair and fit engineering components	
UEPMNT403	Maintain complex mechanical valves	40
	∟UEPMNT303 Maintain mechanical valves	
	∟MEM18006C Repair and fit engineering components	
	∟MEM09002B Interpret technical drawing	
	∟MEM12023A Perform engineering measurements	
	∟MEM18001C Use hand tools	
	∟MEM18002B Use power tools/hand held operations	
	∟MEM18003C Use tools for precision work	
	∟MEM18055B Dismantle, replace and assemble engineering components	
UEPMNT404	Maintain complex mechanical pumps	40
	∟UEPMNT304 Maintain mechanical pumps	
	∟MEM18006C Repair and fit engineering components	
	∟MEM09002B Interpret technical drawing	
	∟MEM12023A Perform engineering measurements	
	∟MEM18001C Use hand tools	
	∟MEM18002B Use power tools/hand held operations	
	∟MEM18003C Use tools for precision work	
	∟MEM18055B Dismantle, replace and assemble	

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	engineering components	
UEPMNT408	Install hydro turbines	100
	∟UEPMNT402 Conduct complex levelling and alignment	
	∟MEM18009B Perform levelling and alignment of machines and engineering components	
	∟MEM09002B Interpret technical drawing	
	∟MEM12023A Perform engineering measurements	
	∟MEM18001C Use hand tools	
	∟MEM18002B Use power tools/hand held operations	
	∟MEM18003C Use tools for precision work	
	∟MEM18055B Dismantle, replace and assemble engineering components	
	∟MEM18006C Repair and fit engineering components	
UEPMNT419	Perform civil drafting	60
	∟UEENEEE107A Use drawings, diagrams, schedules, standards, codes and specifications	
	∟MEM09002B Interpret technical drawing	
UEPMNT422	Conduct performance testing on process plant and equipment	60
	∟UEPMNT351 Test and commission electrical equipment	
	∟UEENEEG108A Troubleshoot and repair faults in low voltage electrical apparatus and circuits	
	∟UEENEEE102A Fabricate, assemble and dismantle utilities industry components	
	∟UEENEEE104A Solve problems in D.C. circuits	
	∟UEENEEE105A Fix and secure electrotechnology equipment	
	∟UEENEEE107A Use drawings, diagrams, schedules, standards, codes and specifications	
	∟UEENEEG006A Solve problems in single and three phase low voltage machines	
	∟UEENEEG033A Solve problems in single and three phase low voltage electrical apparatus and circuits	
	∟UEENEEG063A Arrange circuits, control and	

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	protection for general electrical installations ∟UEENEEG101A Solve problems in electromagnetic devices and related circuits ∟UEENEEG102A Solve problems in low voltage A.C. circuits ∟UEENEEG106A Terminate cables, cords and accessories for low voltage circuits	
UEPOPS402	Conduct multiple energy source isolation procedures for permit to work ∟UEPOPS301 Conduct single energy source isolation procedures for permit to work.	40

Group D elective units		**Weighting points**
UEPOPS502	Manage permit to work system ∟UEPOPS403 Coordinate permit to work system ∟UEPOPS402 Conduct multiple energy source isolation procedures for permit to work	40
UEPOPS508	Manage commissioning and decommissioning	60
UEPOPS509	Manage quality control procedures	40
UEPOPS510	Monitor power generation plant reliability	60
UEPOPS511	Tune process plant and equipment	60
UEPOPS512	Manage high voltage network system ∟UEPOPS420 Coordinate network/system	80
UEPOPS513	Manage operational crisis to maintain or restore power system integrity	60
UEPOPS515	Coordinate power generation	40
UEPOPS520	Evaluate cost estimations and initiate appropriate solutions ∟UEENEEC005B Estimate electrotechnology projects	40
UEPOPS523	Manage critical incidents ∟UEPOPS369 Respond to a critical incident ∟UEPOPS454 Coordinate response to critical incidents	60

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UEPOPS524	Evaluate scheduling of generation plant ∟UEPOPS422 Schedule generation	60
UEPOPS525	Coordinate and direct switching program ∟UEPOPS456 Perform switching to a switching program	60
UEPOPS526	Coordinate electrical energy production ∟UEPOPS457 Control electrical energy production	60
UEPOPS527	Manage first response team ∟UEPOPS404 Coordinate first response team operation	40
UEPOPS528	Manage environmental management systems	40
UEPOPS529	Manage operational strategies for power production	80

Qualification Mapping Information

This qualification replaces and is equivalent to UEP50312 Diploma of ESI Generation (Maintenance)

Links

Companion Volume implementation guides are found in VETNet - https://vetnet.gov.au/Pages/TrainingDocs.aspx?q=1715b9fa-e7bd-441c-bb8d-cf22c9c825a8

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UEP50418 Diploma of ESI Generation Maintenance - Electrical Electronic

Modification History

Release 2. This is the second release of this qualification in the Electricity Supply Industry - Generation Sector Training Package. The following modification has been made:

• UEPMNT415 Diagnose and repair faults in complex refrigeration and air conditioning equipment, UEPMNT501 Diagnose and repair faults in electrical and electronic systems, UEPMNT503 Diagnose and repair faults in instrumentation systems, UEPMNT345 Install electronic equipment, UEPMNT319 Maintain and test fixed fire protection systems, UEPMNT426 Maintain electronic instrumentation equipment, UEPMNT362 Maintain wind turbine control systems, UEPMNT361 Maintain wind turbine mechanical systems, UEPMNT413 Modify electronic electrical equipment, UEPMNT429 Modify electronic instrumentation equipment, UEPMNT424 Monitor efficiency of thermal steam cycle power plant, UEPMNT416 Overhaul electrical generator, UEPMNT352 Test and commission electronic electrical equipment, UEPMNT502 Test and commission electronic electrical systems, UEPMNT431 Test and commission electronic instrumentation equipment and UEPMNT504 Test and commission instrumentation systems deleted due to zero enrolment.

Release 1. This is the first release of this qualification in the UEP - Electricity Supply Industry - Generation Sector Training Package.

Qualification Description

Participants gaining this qualification will be able to manufacture, fit, assemble, erect, operate, test, diagnose faults, alter and repair electrical and electronic equipment including instrumentation systems. It does not include installation of any electrical wiring systems within an electrical installation as prescribed in current industry standards.

Functions can include maintenance planning and scheduling, as well as electrical wiring work if it is associated with assembling, maintaining, terminating or altering the wiring between electrical components within power generating plant or machinery. It also includes the supervision of others and the coordination of work activities.

Electrical equipment means any appliance, article, accessory, wire, fitting, cable, conduit or apparatus that generates, uses, conveys or controls, or that is intended to generate, use, convey or control electricity above extra low voltage.

No licensing, legislative or certification requirements apply to this qualification at the time of publication.

Entry Requirements

There are no entry requirements for this qualification.

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Packaging Rules

A total 1600 weighting points comprising 1010 core weighting points, plus 590 general elective weighting points from the general elective units listed below.

Choose a minimum of 870 weighting point elective units from the list below; up to 270 weighting points can be taken from Group A. A maximum 180 weighting points can be selected from Group B. A maximum 240 weighting points can be selected from Group C. A minimum of 180 to a maximum of 540 weighting points may be taken from Group D. You may select all your elective units from this group.

Up to 270 weighting points of the general elective units Group A, may be selected, with appropriate contextualisation, from any relevant nationally endorsed Training Package or accredited course, provided that selected units contribute to the vocational outcome of the qualification. Previously assigned weighting points are listed in UEP CVIG, if not listed weighting points will be 10 points unless directed from the ESI Generation Industry Reference Committee (IRC). The general elective units must contribute to the vocational outcomes of the qualification. The general elective units must contribute to the vocational outcomes of the qualification.

Where imported units are selected, care must be taken to ensure that all prerequisite units specified are complied with.

Core units		**Weighting points**
UEENEEE101A	Apply Occupational, Health and Safety regulations, codes and practices in the workplace	20
UEENEEE102A	Fabricate, assemble, dismantle utilities components ∟UEENEEE101A Apply Occupational, Health and Safety regulations, codes and practices in the workplace	40
UEENEEE104A	Solve problems in D.C. circuits ∟UEENEEE101A Apply Occupational, Health and Safety regulations, codes and practices in the workplace	80
UEENEEE105A	Fix and secure electrotechnology equipment ∟UEENEEE101A Apply Occupational, Health and Safety regulations, codes and practices in the workplace	20
UEENEEE107A	Use drawings, diagrams, schedules, standards, codes and specifications ∟UEENEEE101A Apply Occupational, Health and Safety regulations, codes and practices in the workplace	40
UEENEEE117A	Implement and monitor energy sector OHS policies and procedures	20

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UEENEEE137A	Document and apply measures to control OHS risks associated with electrotechnology work	20
	∟UEENEEE101A Apply Occupational, Health and Safety regulations, codes and practices in the workplace	
UEENEEG006A	Solve problems in single and three phase low voltage machines	80
	∟UEENEEE101A Apply Occupational, Health and Safety regulations, codes and practices in the workplace	
	∟UEENEEE102A Fabricate, assemble and dismantle utilities industry components	
	∟UEENEEE104A Solve problems in D.C. circuits	
	∟UEENEEE105A Fix and secure electrotechnology equipment	
	∟UEENEEE107A Use drawings, diagrams, schedules, standards, codes and specifications	
	∟UEENEEG101A Solve problems in electromagnetic devices and related circuits	
	∟UEENEEG102A Solve problems in low voltage A.C. circuit	
	∟UEENEEG106A Terminate cables, cords and accessories for low voltage circuits	
UEENEEG033A	Solve problems in single and three phase low voltage electrical apparatus and circuits	60
	∟UEENEEE101A Apply Occupational, Health and Safety regulations, codes and practices in the workplace	
	∟UEENEEE102A Fabricate, assemble and dismantle utilities industry components	
	∟UEENEEE104A Solve problems in D.C. circuits	
	∟UEENEEE105A Fix and secure electrotechnology equipment	
	∟UEENEEE107A Use drawings, diagrams, schedules, standards, codes and specifications	
	∟UEENEEG101A Solve problems in electromagnetic devices and related circuits	
	∟UEENEEG102A Solve problems in low voltage A.C. circuit	
	∟UEENEEG106A Terminate cables, cords and accessories for low voltage circuits	

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UEENEEG063A	Arrange circuits, control and protection for general electrical installations	40
	∟UEENEEE101A Apply Occupational, Health and Safety regulations, codes and practices in the workplace	
	∟UEENEEE102A Fabricate, assemble and dismantle utilities industry components	
	∟UEENEEE104A Solve problems in D.C. circuits	
	∟UEENEEE105A Fix and secure electrotechnology equipment	
	∟UEENEEE107A Use drawings, diagrams, schedules, standards, codes and specifications	
	∟UEENEEG101A Solve problems in electromagnetic devices and related circuits	
	∟UEENEEG102A Solve problems in low voltage A.C. circuit	
	∟UEENEEG106A Terminate cables, cords and accessories for low voltage circuits	
UEENEEG101A	Solve problems in electromagnetic devices and related circuits	60
	∟UEENEEE101A Apply Occupational, Health and Safety regulations, codes and practices in the workplace	
	∟UEENEEE104A Solve problems in D.C. circuits	
UEENEEG102A	Solve problems in low voltage A.C circuits	80
	∟UEENEEE101A Apply Occupational, Health and Safety regulations, codes and practices in the workplace	
	∟UEENEEE104A Solve problems in D.C. circuits	
	∟UEENEEG101A Solve problems in electromagnetic devices and related circuits	
UEENEEG106A	Terminate cables, cords and accessories for low voltage circuits	40
	∟UEENEEE101A Apply Occupational, Health and Safety regulations, codes and practices in the workplace	
	∟UEENEEE102A Fabricate, assemble and dismantle utilities industry components	
	∟UEENEEE105A Fix and secure electrotechnology equipment	
	∟UEENEEE107A Use drawings, diagrams, schedules,	

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	standards, codes and specifications	
UEENEEG108A	Troubleshoot and repair faults in low voltage electrical apparatus and circuits	40
	∟UEENEEE101A Apply Occupational, Health and Safety regulations, codes and practices in the workplace	
	∟UEENEEE102A Fabricate, dismantle, assemble of utilities components	
	∟UEENEEE104A Solve problems in D.C. circuits	
	∟UEENEEE105A Fix and secure electrotechnology equipment	
	∟UEENEEE107A Use drawings, diagrams, schedules, standards, codes and specifications	
	∟UEENEEG006A Solve problems in single and three phase low voltage machines	
	∟UEENEEG033A Solve problems in single and three phase electrical apparatus and circuits	
	∟UEENEEG063A Arrange circuits, control and protection for general electrical installations	
	∟UEENEEG101A Solve problems in electromagnetic devices and related circuits	
	∟UEENEEG102A Solve problems in low voltage A.C. circuits	
	∟UEENEEG106A Terminate cables, cords and accessories for low voltage circuits	
UEENEEG109A	Develop and connect electrical control circuits	80
	∟UEENEEE101A Apply Occupational, Health and Safety regulations, codes and practices in the workplace	
	∟UEENEEE102A Fabricate, assemble and dismantle utilities industry components	
	∟UEENEEE104A Solve problems in D.C. circuits	
	∟UEENEEE105A Fix and secure electrotechnology equipment	
	∟UEENEEE107A Use drawings, diagrams, schedules, standards, codes and specifications	
	∟UEENEEG006A Solve problems in single and three phase low voltage machines	
	∟UEENEEG063A Arrange circuits, control and	

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	protection for general electrical installations	
	∟UEENEEG101A Solve problems in electromagnetic devices and related circuits	
	∟UEENEEG102A Solve problems in low voltage A.C. circuit	
	∟UEENEEG106A Terminate cables, cords and accessories for low voltage circuits	
UEPOPS337	Maintain quality systems within the team	20
	∟UEPOPS202 Apply quality systems to work	
UEPOPS202	Apply quality systems to work	20
UEPOPS338	Facilitate workplace communication	20
UEPOPS371	Carry out operational checks on in-service electrical plant	40
UEPOPS417	Monitor and implement environmental site plans and procedures	20
UEPOPS430	Control permit to work operations	20
UEPOPS439	Plan and organise work	30
UEPOPS501	Manage Work, Health and Safety policy and procedures	40
	∟UEENEEE117A Implement and monitor energy sector OHS policies and procedures	
UEPOPS507	Conduct project management	60
UEPOPS509	Manage quality control procedures	40

Group A elective units		**Weighting points**
BSBWOR501	Manage personal work priorities and professional development	60
BSBMGT502	Manage people performance	70
BSBMGT517	Manage operational plan	60
BSBINM501	Manage an information or knowledge management system	50

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BSBCUS501	Manage quality customer service	40
BSBMGT516	Facilitate continuous improvement	60
BSBINN502	Build and sustain an innovative work environment	50
BSBLED501	Develop a workplace learning environment	60
BSBWOR502	Lead and manage team effectiveness	60
BSBWHS501	Ensure a safe workplace	60

Group B elective units		**Weighting points**
UEPMNT346	Maintain electrical equipment	40
	∟UEENEEG108A Trouble shoot and repair faults in low voltage electrical apparatus and circuits	
	∟UEENEEE102A Fabricate, assemble and dismantle utilities industry components	
	∟UEENEEE105A Fix and secure electrotechnology equipment	
	∟UEENEEE107A Use drawings, diagrams, schedules, standards, cords and specifications	
	∟UEENEEG006A Solve problems in single and three phase low voltage machines	
	∟UEENEEG033A Solve problems in single and three phase low voltage electrical apparatus and circuits	
	∟UEENEEG063A Arrange circuits, control and protection for general electrical installations	
	∟UEENEEG101A Solve problems in electromagnetic devices and related circuits	
	∟UEENEEG102A Solve problems in low voltage A.C. circuits	
	∟UEENEEG106A Terminate cables, cords and accessories for low voltage circuits	
UEPMNT347	Maintain complex electrical equipment	60
	∟UEPMNT346 Maintain electrical equipment	
UEPMNT348	Maintain electrical electronic equipment	40
	∟UEENEEG108A Trouble shoot and repair faults in	

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	low voltage electrical apparatus and circuits	
	∟UEENEEE107A Use drawings, diagrams, schedules, standards, cords and specifications	
	∟UEENEEG006A Solve problems in single and three phase low voltage machines	
	∟UEENEEG033A Solve problems in single and three phase low voltage electrical apparatus and circuits	
	∟UEENEEG063A Arrange circuits, control and protection for general electrical installations	
	∟UEENEEG101A Solve problems in electromagnetic devices and related circuits	
	∟UEENEEG102A Solve problems in low voltage A.C. circuits	
	∟UEENEEG106A Terminate cables, cords and accessories for low voltage circuits	
UEPMNT350	Modify electrical equipment	40
	∟UEENEEG108A Troubleshoot and repair faults in low voltage electrical apparatus and circuits	
	∟UEENEEE107A Use drawings, diagrams, schedules, standards, cords and specifications	
	∟UEENEEG006A Solve problems in single and three phase low voltage machines	
	∟UEENEEG033A Solve problems in single and three phase low voltage electrical apparatus and circuits	
	∟UEENEEG063A Arrange circuits, control and protection for general electrical installations	
	∟UEENEEG101A Solve problems in electromagnetic devices and related circuits	
	∟UEENEEG102A Solve problems in low voltage A.C. circuits	
	∟UEENEEG106A Terminate cables, cords and accessories for low voltage circuits	
UEPMNT351	Test and commission electrical equipment	40
	∟UEENEEG108A Troubleshoot and repair faults in low voltage electrical apparatus and circuits	
	∟UEENEEE102A Fabricate, assemble and dismantle utilities industry components	
	∟UEENEEE104A Solve problems in D.C. circuits	

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	∟UEENEEE105A Fix and secure electrotechnology equipment	
	∟UEENEEE107A Use drawings, diagrams, schedules, standards, cords and specifications	
	∟UEENEEG006A Solve problems in single and three phase low voltage machines	
	∟UEENEEG033A Solve problems in single and three phase low voltage electrical apparatus and circuits	
	∟UEENEEG063A Arrange circuits, control and protection for general electrical installations	
	∟UEENEEG101A Solve problems in electromagnetic devices and related circuits	
	∟UEENEEG102A Solve problems in low voltage A.C. circuits	
	∟UEENEEG106A Terminate cables, cords and accessories for low voltage circuits	
UEPMNT355	Install complex electronic instrumentation equipment	40
	∟UEENEEI108A Install instrumentation and control apparatus and associated equipment	
	∟ UEENEEE102AFabricate, assemble and dismantle utilities industry components	
	∟ UEENEEE105A Fix and secure electrotechnology equipment	
	∟ UEENEEE107A Use drawings, diagrams, schedules, standards, cords and specifications	
UEPMNT356	Maintain instrumentation equipment	40
	∟ UEENEEE102AFabricate, assemble and dismantle utilities industry components	
	∟ UEENEEE105A Fix and secure electrotechnology equipment	
	∟ UEENEEE107A Use drawings, diagrams, schedules, standards, cords and specifications	
UEPMNT357	Diagnose and repair faults in instrumentation equipment	60
	UEENEEE102AFabricate, assemble and dismantle utilities industry components	
	∟UEENEEE105A Fix and secure electrotechnology equipment	
	∟ UEENEEE107A Use drawings, diagrams, schedules,	

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	standards, cords and specifications	
UEPMNT358	Modify instrumentation equipment	40
	∟ UEENEEE102AFabricate, assemble and dismantle utilities industry components	
	∟ UEENEEE105A Fix and secure electrotechnology equipment	
	∟ UEENEEE107A Use drawings, diagrams, schedules, standards, cords and specifications	
UEPMNT359	Test and commission instrumentation equipment	40
	UEENEEE102AFabricate, assemble and dismantle utilities industry components	
	∟ UEENEEE105A Fix and secure electrotechnology equipment	
	∟ UEENEEE107A Use drawings, diagrams, schedules, standards, cords and specifications	
UEPMNT366	Maintain power plant inverter systems	60
	∟UEENEEG108A Troubleshoot and repair faults in low voltage electrical apparatus and circuits	
	∟UEENEEE102A Fabricate, assemble and dismantle utilities industry components	
	∟UEENEEE104A Solve problems in D.C. circuits	
	∟UEENEEE105A Fix and secure electrotechnology equipment	
	∟UEENEEE107A Use drawings, diagrams, schedules, standards, cords and specifications	
	∟UEENEEG006A Solve problems in single and three phase low voltage machines	
	∟UEENEEG033A Solve problems in single and three phase low voltage electrical apparatus and circuits	
	∟UEENEEG063A Arrange circuits, control and protection for general electrical installations	
	∟UEENEEG101A Solve problems in electromagnetic devices and related circuits	
	∟UEENEEG102A Solve problems in low voltage A.C. circuits	
	∟UEENEEG106A Terminate cables, cords and accessories for low voltage circuits	

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UEPOPS301	Conduct single energy source isolation procedures for permit to work	40

Group C elective units		**Weighting points**
UEENEEC005B	Estimate electrotechnology projects	40
UEENEEE124A	Compile and produce an energy sector detailed report	60
UEPMNT410	Diagnose and repair faults in electronic equipment ∟UEENEEG108A Trouble shoot and repair faults in low voltage electrical apparatus and circuits ∟UEENEEE102A Fabricate, assemble and dismantle utilities industry components ∟UEENEEE104A Solve problems in D.C. circuits ∟UEENEEE105A Fix and secure electrotechnology equipment ∟UEENEEE107A Use drawings, diagrams, schedules, standards, cords and specifications ∟UEENEEG006A Solve problems in single and three phase low voltage machines ∟UEENEEG033A Solve problems in single and three phase low voltage electrical apparatus and circuits ∟UEENEEG063A Arrange circuits, control and protection for general electrical installations ∟UEENEEG101A Solve problems in electromagnetic devices and related circuits ∟UEENEEG102A Solve problems in low voltage A.C. circuits ∟UEENEEG106A Terminate cables, cords and accessories for low voltage circuits	60
UEPMNT411	Diagnose and repair faults in complex electrical equipment ∟UEENEEG108A Trouble shoot and repair faults in low voltage electrical apparatus and circuits ∟UEENEEE102A Fabricate, assemble and dismantle utilities industry components ∟UEENEEE104A Solve problems in D.C. circuits ∟UEENEEE105A Fix and secure electrotechnology	60

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	equipment	
	∟UEENEEE107A Use drawings, diagrams, schedules, standards, cords and specifications	
	∟UEENEEG006A Solve problems in single and three phase low voltage machines	
	∟UEENEEG033A Solve problems in single and three phase low voltage electrical apparatus and circuits	
	∟UEENEEG063A Arrange circuits, control and protection for general electrical installations	
	∟UEENEEG101A Solve problems in electromagnetic devices and related circuits	
	∟UEENEEG102A Solve problems in low voltage A.C. circuits	
	∟UEENEEG106A Terminate cables, cords and accessories for low voltage circuit	
UEPMNT412	Modify complex electrical equipment	60
	∟UEPMNT350 Modify electrical equipment	
	∟UEENEEG108A Trouble shoot and repair faults in low voltage electrical apparatus and circuits	
	∟UEENEEE102A Fabricate, assemble and dismantle utilities industry components	
	∟UEENEEE104A Solve problems in D.C. circuits	
	∟UEENEEE105A Fix and secure electrotechnology equipment	
	∟UEENEEE107A Use drawings, diagrams, schedules, standards, cords and specifications	
	∟UEENEEG006A Solve problems in single and three phase low voltage machines	
	∟UEENEEG033A Solve problems in single and three phase low voltage electrical apparatus and circuits	
	∟UEENEEG063A Arrange circuits, control and protection for general electrical installations	
	∟UEENEEG101A Solve problems in electromagnetic devices and related circuits	
	∟UEENEEG102A Solve problems in low voltage A.C. circuits	
	∟UEENEEG106A Terminate cables, cords and accessories for low voltage circuits	

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UEPMNT414	Test and commission complex electrical equipment	60
	∟UEPMNT351 Test and commission electrical equipment	
	∟UEENEEG108A Trouble shoot and repair faults in low voltage electrical apparatus and circuits	
	∟UEENEEE102A Fabricate, assemble and dismantle utilities industry components	
	∟UEENEEE104A Solve problems in D.C. circuits	
	∟UEENEEE105A Fix and secure electrotechnology equipment	
	∟UEENEEE107A Use drawings, diagrams, schedules, standards, cords and specifications	
	∟UEENEEG006A Solve problems in single and three phase low voltage machines	
	∟UEENEEG033A Solve problems in single and three phase low voltage electrical apparatus and circuits	
	∟UEENEEG063A Arrange circuits, control and protection for general electrical installations	
	∟UEENEEG101A Solve problems in electromagnetic devices and related circuits	
	∟UEENEEG102A Solve problems in low voltage A.C. circuits	
	∟UEENEEG106A Terminate cables, cords and accessories for low voltage circuits	
UEPMNT417	Inspect electrical generators and diagnose faults	80
	∟UEPMNT351 Test and commission electrical equipment	
	∟UEENEEG108A Trouble shoot and repair faults in low voltage electrical apparatus and circuits	
	∟UEENEEE102A Fabricate, assemble and dismantle utilities industry components	
	∟UEENEEE104A Solve problems in D.C. circuits	
	∟UEENEEE105A Fix and secure electrotechnology equipment	
	∟UEENEEE107A Use drawings, diagrams, schedules, standards, cords and specifications	
	∟UEENEEG006A Solve problems in single and three phase low voltage machines	

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	∟UEENEEG033A Solve problems in single and three phase low voltage electrical apparatus and circuits	
	∟UEENEEG063A Arrange circuits, control and protection for general electrical installations	
	∟UEENEEG101A Solve problems in electromagnetic devices and related circuits	
	∟UEENEEG102A Solve problems in low voltage A.C. circuits	
	∟UEENEEG106A Terminate cables, cords and accessories for low voltage circuits	
UEPMNT421	Conduct technical inspection of process plant and equipment	60
	∟UEPMNT351 Test and commission electrical equipment	
	∟UEENEEG108A Trouble shoot and repair faults in low voltage electrical apparatus and circuits	
	∟UEENEEE102A Fabricate, assemble and dismantle utilities industry components	
	∟UEENEEE104A Solve problems in D.C. circuits	
	∟UEENEEE105A Fix and secure electrotechnology equipment	
	∟UEENEEE107A Use drawings, diagrams, schedules, standards, cords and specifications	
	∟UEENEEG006A Solve problems in single and three phase low voltage machines	
	∟UEENEEG033A Solve problems in single and three phase low voltage electrical apparatus and circuits	
	∟UEENEEG063A Arrange circuits, control and protection for general electrical installations	
	∟UEENEEG101A Solve problems in electromagnetic devices and related circuits	
	∟UEENEEG102A Solve problems in low voltage A.C. circuits	
	∟UEENEEG106A Terminate cables, cords and accessories for low voltage circuits	
UEPMNT422	Conduct performance testing on process plant and equipment	60
	∟UEPMNT351 Test and commission electrical equipment	

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	∟UEENEEG108A Trouble shoot and repair faults in low voltage electrical apparatus and circuits	
	∟UEENEEE102A Fabricate, assemble and dismantle utilities industry components	
	∟UEENEEE104A Solve problems in D.C. circuits	
	∟UEENEEE105A Fix and secure electrotechnology equipment	
	∟UEENEEE107A Use drawings, diagrams, schedules, standards, cords and specifications	
	∟UEENEEG006A Solve problems in single and three phase low voltage machines	
	∟UEENEEG033A Solve problems in single and three phase low voltage electrical apparatus and circuits	
	∟UEENEEG063A Arrange circuits, control and protection for general electrical installations	
	∟UEENEEG101A Solve problems in electromagnetic devices and related circuits	
	∟UEENEEG102A Solve problems in low voltage A.C. circuits	
	∟UEENEEG106A Terminate cables, cords and accessories for low voltage circuit	
UEPMNT425	Maintain complex instrumentation equipment	80
	∟UEPMNT356 Maintain instrumentation equipment	
	∟UEENEEE102 Fabricate, assemble and dismantle utilities industry components	
	∟UEENEEE105A Fix and secure electrotechnology equipment	
	∟UEENEEE107A Use drawings, diagrams, schedules, standards, codes and specifications	
UEPMNT427	Diagnose and repair faults in complex instrumentation equipment	80
	∟UEPMNT356 Maintain instrumentation equipment	
	∟UEENEEE102A Fabricate, assemble and dismantle utilities industry components	
	∟UEENEEE105A Fix and secure electrotechnology equipment	
	∟UEENEEE107A Use drawings, diagrams, schedules, standards, codes and specifications	

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UEPMNT428	Modify complex instrumentation equipment	80
	∟UEPMNT356 Maintain instrumentation equipment	
	∟UEENEEE102A Fabricate, assemble and dismantle utilities industry components	
	∟UEENEEE105A Fix and secure electrotechnology equipment	
	∟UEENEEE107A Use drawings, diagrams, schedules, standards, codes and specifications	
UEPMNT430	Test and commission complex instrumentation equipment	80
	∟UEPMNT359 Test and commission instrumentation equipment	
	∟UEENEEE102A Fabricate, assemble and dismantle utilities industry components	
	∟UEENEEE105A Fix and secure electrotechnology equipment	
	∟UEENEEE107A Use drawings, diagrams, schedules, standards, codes and specifications	
UEPOPS402	Conduct multiple energy source isolation procedures for permit to work	40
	∟UEPOPS301 Conduct single energy source isolation procedures for permit to work.	
UEPOPS440	Coordinate team activities	30

Group D elective units		**Weighting points**
UEPOPS508	Manage commissioning and decommissioning	80
UEPOPS511	Tune process plant and equipment	60

Qualification Mapping Information

This qualification replaces and is equivalent to UEP50412 Diploma of ESI Generation Maintenance - Electrical Electronic

Links

Companion Volume implementation guides are found in VETNet - https://vetnet.gov.au/Pages/TrainingDocs.aspx?q=1715b9fa-e7bd-441c-bb8d-cf22c9c825a8

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BSBCUS201 Deliver a service to customers

Modification History

Release	Comments
Release 1	This version first released with BSB Business Services Training Package Version 1.0.

Application

This unit describes the skills and knowledge required to deliver all aspects of customer service at an introductory level. It includes creating a relationship with customers, identifying their needs, delivering services or products and processing customer feedback.

It applies to individuals who perform a range of routine tasks in the workplace using a limited range of practical skills and fundamental knowledge of customer service in a defined context under direct supervision or with limited individual responsibility.

No licensing, legislative or certification requirements apply to this unit at the time of publication.

Unit Sector

Stakeholder Relations – Customer Service

Elements and Performance Criteria

ELEMENT	PERFORMANCE CRITERIA
Elements describe the essential outcomes.	*Performance criteria describe the performance needed to demonstrate achievement of the element.*
1 Establish contact with customers	1.1 Acknowledge and greet customer in a professional, courteous and concise manner according to organisational and legislative requirements 1.2 Maintain personal dress and presentation in line with organisational requirements 1.3 Communicate using appropriate interpersonal skills to facilitate accurate and relevant exchange of information

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ELEMENT	PERFORMANCE CRITERIA
	1.4 Maintain sensitivity to customer specific needs and any cultural, family and individual differences 1.5 Establish rapport/relationship with customer and express a genuine interest in customer needs/requirements
2 Identify customer needs	2.1 Use appropriate questioning and active listening to determine customer needs 2.2 Assess customer needs for urgency to identify priorities for service delivery 2.3 Provide customer with information about available options for meeting customer needs and assist customer to identify preferred option/s 2.4 Identify personal limitations in addressing customer needs and seek assistance from designated persons where required
3 Deliver service to customers	3.1 Provide prompt customer service to meet identified needs according to organisational requirements 3.2 Provide information regarding problems and delays, and follow-up within appropriate timeframes as necessary 3.3 Communicate with customers in a clear, concise and courteous manner 3.4 Identify opportunities to enhance the quality of service and products, and take action to improve the service whenever possible
4 Process customer feedback	4.1 Promptly recognise customer feedback and handle sensitively according to organisational and legislative requirements 4.2 Accurately record any feedback and communication between customers and the organisation according to organisational standards, policies and procedures and legislative requirements 4.3 Identify any unmet customer needs and discuss suitability of other products/services 4.4 Support customers to make contact with other services according to organisational policies and procedures

Foundation Skills

This section describes language, literacy, numeracy and employment skills incorporated in the performance criteria that are required for competent performance.

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Skill	Performance Criteria	Description
Reading	1.1, 1.2, 3.1, 4.1, 4.2, 4.4	• Understands requirements in organisational policy and procedure documents • Interprets product and service information in a range of formats to provide customer advice
Writing	4.2	• Records customer information according to organisational requirements
Oral Communication	1.1, 1.3, 1.4, 1.5, 2.1-2.4, 3.2, 3.3, 4.3	• Provides information or advice using structure and language to suit the audience • Asks questions and listens to gain information or confirm understanding
Navigate the world of work	1.1, 1.2, 3.1, 4.1, 4.2, 4.4	• Follows organisational procedures and practices relevant to own role
Interact with others	1.1, 1.3-1.5, 2.1-2.4, 3.1, 3.2, 3.3, 4.1, 4.3, 4.4	• Uses accepted communication practices to establish connections, build rapport and develop professional working relationships • Adjusts personal communication style in response to the opinions, values and particular needs of others
Get the work done	3.2, 3.4, 4.1- 4.3	• Addresses routine problems in familiar work contexts • Recognises opportunities to enhance work practices and outcomes

Unit Mapping Information

Code and title current version	Code and title previous version	Comments	Equivalence status
BSBCUS201 Deliver a service to customers	BSBCUS201B Deliver a service to customers	Updated to meet Standards for Training Packages	Equivalent unit

Links

Companion Volume implementation guides are found in VETNet - https://vetnet.gov.au/Pages/TrainingDocs.aspx?q=11ef6853-ceed-4ba7-9d87-4da407e23c10

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Assessment Requirements for BSBCUS201 Deliver a service to customers

Modification History

Release	Comments
Release 1	This version first released with Business Services Training Package Version 1.0.

Performance Evidence

Evidence of the ability to:

- greet customer and establish rapport/relationship in accordance with organisational requirements
- identify customer needs using appropriate interpersonal skills
- provide prompt service to address customer needs in accordance with organisational requirements
- identify and follow up opportunities to increase the quality of service and products
- respond to and record all customer feedback according to organisational standards, policies and procedures.

Note: If a specific volume or frequency is not stated, then evidence must be provided at least once.

Knowledge Evidence

To complete the unit requirements safely and effectively, the individual must:

- identify and briefly describe key provisions of relevant legislation from all forms of government that apply to provision of customer services
- identify and explain workplace organisational policies and procedures relating to customer service and the customer service process.

Assessment Conditions

Assessment must be conducted in a safe environment where evidence gathered demonstrates consistent performance of typical activities experienced in the customer service field of work and include access to:

- office equipment and technology
- workplace documents, organisational policies and procedures for customer service

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- examples of customer complaints and feedback
- case studies and, where possible, real situations
- interaction with others.

Assessors must satisfy NVR/AQTF assessor requirements.

Links

Companion Volume implementation guides are found in VETNet - https://vetnet.gov.au/Pages/TrainingDocs.aspx?q=11ef6853-ceed-4ba7-9d87-4da407e23c10

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BSBCUS401 Coordinate implementation of customer service strategies

Modification History

Release	Comments
Release 2	This version released with BSB Business Services Training Package Version 2.0 Version created to clarify assessment conditions
Release 1	This version first released with BSB Business Services Training Package Version 1.0.

Application

This unit describes the skills and knowledge required to advise, carry out and evaluate customer service strategies.

It applies to individuals who have well developed skills and a broad knowledge of customer service strategies for addressing customer needs and problems, and who may provide guidance or delegate work related tasks to others.

No licensing, legislative or certification requirements apply to this unit at the time of publication.

Unit Sector

Stakeholder Relations – Customer Service

Elements and Performance Criteria

ELEMENT	PERFORMANCE CRITERIA
Elements describe the essential outcomes.	*Performance criteria describe the performance needed to demonstrate achievement of the element.*
1 Advise on customer service needs	1.1 Clarify and accurately assess customer needs using appropriate communication techniques

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ELEMENT	PERFORMANCE CRITERIA
	1.2 Diagnose problems matching service delivery to customers and develop options for improved service within organisational requirements 1.3 Provide relevant and constructive advice to promote the improvement of customer service delivery 1.4 Use business technology and/or online services to structure and present information on customer service needs
2 Support implementation of customer service strategies	2.1 Ensure customer service strategies and opportunities are promoted to designated individuals and groups 2.2 Identify and allocate available budget resources to fulfil customer service objectives 2.3 Promptly action procedures to resolve customer difficulties and complaints within organisational requirements 2.4 Ensure that decisions to implement strategies are taken in consultation with designated individuals and groups
3 Evaluate and report on customer service	3.1 Review client satisfaction with service delivery using verifiable data in accordance with organisational requirements 3.2 Identify and report changes necessary to maintain service standards to designated individuals and groups 3.3 Prepare conclusions and recommendations from verifiable evidence and provide constructive advice on future directions of client service strategies 3.4 Maintain systems, records and reporting procedures to compare changes in customer satisfaction

Foundation Skills

This section describes language, literacy, numeracy and employment skills incorporated in the performance criteria that are required for competent performance.

Skill	Performance Criteria	Description
Reading	1.2, 1.4, 2.3, 3.1	• Reviews textual information and comprehends details that relate to the interests or requirements of the client and organisation
Writing	1.4, 3.3, 3.4	• Creates a range of formal texts using structure, grammar and clear and specialised language to

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		describe customer needs, maintain information and support a particular position
Oral Communication	1.1, 1.3, 2.1, 2.4, 3.2	• Uses pace, intonation, intelligible pronunciation and listening and questioning techniques to interact effectively with others
Numeracy	2.2	• Recognises and interprets numerical information and performs calculations on familiar mathematical information
Navigate the world of work	1.2, 2.3, 3.1, 3.2	• Recognises and applies organisational protocols and meets expectations associated with own work
Interact with others	1.1, 1.3, 2.1, 2.4, 3.2, 3.3	• Selects the appropriate form, channel and mode of communication for a specific purpose relevant to own role • Uses a range of strategies to establish a sense of connection and build rapport with customers • Collaborates with others contributing knowledge and skills to achieve joint outcomes
Get the work done	1.2, 1.4, 2.3, 3.1- 3.4	• Applies formal and logical processes when planning and implementing tasks • Applies standard procedures when responding to familiar problems within own work context • Uses digital technologies to access, organise, present and store information relevant to own role

Unit Mapping Information

Code and title current version	**Code and title previous version**	**Comments**	**Equivalence status**
BSBCUS401 Coordinate implementation of customer service strategies Release 2	BSBCUS401 Coordinate implementation of customer service strategies Release 1	Updated to clarify assessment conditions	Equivalent unit

Links

Companion Volume implementation guides are found in VETNet - https://vetnet.gov.au/Pages/TrainingDocs.aspx?q=11ef6853-ceed-4ba7-9d87-4da407e23c10

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Assessment Requirements for BSBCUS401 Coordinate implementation of customer service strategies

Modification History

Release	Comments
Release 2	This version released with BSB Business Services Training Package Version 2.0. Version created to clarify assessment conditions
Release 1	This version first released with Business Services Training Package Version 1.0.

Performance Evidence

Evidence of the ability to:

- identify the needs and priorities of the organisation in delivering services to customers
- diagnose problems in delivery of customer service
- respond to and report on customer feedback and complaints
- review client satisfaction using verifiable data
- consult and communicate effectively with relevant people
- develop and implement strategies and methods to improve customer service delivery including:
  - budgeting
  - promotion to staff
  - documentation and follow up.

Note: If a specific volume or frequency is not stated, then evidence must be provided at least once.

Knowledge Evidence

To complete the unit requirements safely and effectively, the individual must:

- outline the principles of customer service
- explain sources of information and techniques for identifying customer needs and reviewing customer satisfaction
- explain the organisational business structure, products and services related to customer service
- describe product and service standards and best practice models.

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Assessment Conditions

Assessment must be conducted in a safe environment where evidence gathered demonstrates consistent performance of typical activities experienced in the customer service field of work and include access to:

- office equipment
- business technology
- organisational policies and procedures for customer service
- examples of customer complaints and feedback
- client satisfaction data
- case studies and, where possible, real situations
- interaction with others.

Assessors of this unit must satisfy the requirements for assessors in applicable vocational education and training legislation, frameworks and/or standards.

Links

Companion Volume implementation guides are found in VETNet - https://vetnet.gov.au/Pages/TrainingDocs.aspx?q=11ef6853-ceed-4ba7-9d87-4da407e23c10

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BSBCUS501 Manage quality customer service

Modification History

Release	Comments
Release 2	This version released with BSB Business Services Training Package Version 2.0. Version created to clarify assessment conditions
Release 1	This version first released with BSB Business Services Training Package Version 1.0.

Application

This unit describes the skills and knowledge required to develop strategies to manage organisational systems that ensure products and services are delivered and maintained to standards agreed by the organisation.

It applies to individuals who supervise the provision of quality customer service within an organisation's procedures framework by others. At this level, individuals must exercise considerable discretion and judgement, using a range of problem solving and decision making strategies.

No licensing, legislative or certification requirements apply to this unit at the time of publication.

Unit Sector

Stakeholder Relations – Customer Service

Elements and Performance Criteria

ELEMENT	PERFORMANCE CRITERIA
Elements describe the essential outcomes.	*Performance criteria describe the performance needed to demonstrate achievement of the element.*
1 Plan to meet internal and external customer	1.1 Investigate, identify, assess, and include the needs of customers in planning processes

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ELEMENT	PERFORMANCE CRITERIA
requirements	1.2 Ensure plans achieve the quality, time and cost specifications agreed with customers
2 Ensure delivery of quality products and services	2.1 Deliver products and services to customer specifications within organisation's business plan 2.2 Monitor team performance to consistently meet the organisation's quality and delivery standards 2.3 Help colleagues overcome difficulties in meeting customer service standards
3 Monitor, adjust and review customer service	3.1 Develop and use strategies to monitor progress in achieving product and/or service targets and standards 3.2 Develop and use strategies to obtain customer feedback to improve the provision of products and services 3.3 Develop, procure and use resources effectively to provide quality products and services to customers 3.4 Make decisions to overcome problems and to adapt customer services, products and service delivery in consultation with appropriate individuals and groups 3.5 Manage records, reports and recommendations within the organisation's systems and processes

Foundation Skills

This section describes language, literacy, numeracy and employment skills incorporated in the performance criteria that are required for competent performance.

Skill	Performance Criteria	Description
Reading	1.1, 1.2, 2.1, 3.1, 3.2, 3.3, 3.5	• Interprets and analyses textual information from a variety of sources and applies the knowledge that has been gained to evaluate standards for organisation's products and services
Writing	1.2, 3.1, 3.2, 3.3, 3.5	• Produces a range of text types to convey information, requirements or recommendations matching style of writing to purpose and audience
Oral Communication	1.1, 1.2, 2.1, 2.3, 3.2	• Clearly articulates systems and standards in a team environment using language suitable to diverse audiences • Uses listening and questioning techniques to obtain

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		feedback and confirm understanding
Numeracy	1.2	• Interprets and comprehends mathematical information in organisation's business and customer service plans.
Navigate the world of work	2.1, 2.2, 3.1, 3.5	• Recognises and applies organisational protocols and meets expectations associated with own work
Interact with others	1.1, 2.3, 3.4	• Identifies and uses appropriate conventions and protocols when communicating with colleagues and customers • Collaborates with others, taking into account their strengths and experience, to achieve desired outcomes • Provides support in field of expertise to team
Get the work done	1.1, 1.2, 2.1, 2.2, 3.1-3.5	• Develops and implements plans using logical processes and monitors and evaluates progress against stated goals • Accepts responsibility for addressing complex or non-routine difficulties, applying problem solving processes in determining a solution. • Uses digital technology to access, organise and present information in a format that meets requirements

Unit Mapping Information

Code and title current version	**Code and title previous version**	**Comments**	**Equivalence status**
BSBCUS501 Manage quality customer service Release 2	BSBCUS501 Manage quality customer service Release 1	Updated to clarify assessment conditions	Equivalent unit

Links

Companion Volume implementation guides are found in VETNet - https://vetnet.gov.au/Pages/TrainingDocs.aspx?q=11ef6853-ceed-4ba7-9d87-4da407e23c10

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Assessment Requirements for BSBCUS501 Manage quality customer service

Modification History

Release	Comments
Release 2	This version released with BSB Business Services Training Package Version 2.0 Version created to clarify assessment conditions
Release 1	This version first released with Business Services Training Package Version 1.0.

Performance Evidence

Evidence of the ability to:

- develop and manage organisational systems for quality customer service
- develop and review plans, policies and procedures for delivering and monitoring quality customer service
- implement policies and procedures to ensure quality customer service
- solve complex customer complaints and system problems that lead to poor customer service
- monitor and assist teams to meet customer service requirements
- develop, procure and use human and physical resources to support quality customer service delivery.

Note: If a specific volume or frequency is not stated, then evidence must be provided at least once.

Knowledge Evidence

To complete the unit requirements safely and effectively, the individual must:

- outline the legislative and regulatory context of the organisation relevant to customer service
- describe organisational policy and procedures for customer service including handling customer complaints
- identify service standards and best practice models
- summarise public relations and product promotion
- outline techniques for dealing with customers including customers with specific needs

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- explain techniques for solving complaints including the principles and techniques involved in the management and organisation of:
  - customer behaviour
  - customer needs research
  - customer relations
  - ongoing product and/or service quality
  - problem identification and resolution
  - quality customer service delivery
  - record keeping and management methods
  - strategies for monitoring, managing and introducing ways to improve customer service relationships
  - strategies to obtain customer feedback.

Assessment Conditions

Assessment must be conducted in a safe environment where evidence gathered demonstrates consistent performance of typical activities experienced in the customer service field of work and include access to:

- legislation, regulations and codes of practice related to customer service
- business technology
- workplace documentation and resources
- complex customer complaints
- case studies and, where possible, real situations
- interaction with others.

Assessors of this unit must satisfy the requirements for assessors in applicable vocational education and training legislation, frameworks and/or standards.

Links

Companion Volume implementation guides are found in VETNet - https://vetnet.gov.au/Pages/TrainingDocs.aspx?q=11ef6853-ceed-4ba7-9d87-4da407e23c10

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BSBFLM303 Contribute to effective workplace relationships

Modification History

Release	Comments
Release 1	This version first released with BSB Business Services Training Package Version 1.0.

Application

This unit describes the skills and knowledge required to gather information and maintain effective relationships and networks, with particular regard to communication and representation.

This unit applies to individuals who use leadership skills including motivation, mentoring and coaching to develop efficient, effective and unified teams and facilitate communication between team members and management of the organisation.

No licensing, legislative or certification requirements apply to this unit at the time of publication.

Unit Sector

Management and Leadership – Frontline Management

Elements and Performance Criteria

ELEMENT	PERFORMANCE CRITERIA
Elements describe the essential outcomes.	*Performance criteria describe the performance needed to demonstrate achievement of the element.*
1 Seek, receive and communicate information and ideas	1.1 Collect information associated with the achievement of work responsibilities from appropriate sources 1.2 Communicate ideas and information to diverse audiences in an appropriate and sensitive manner 1.3 Seek contributions from internal and external sources to develop and refine new ideas and approaches in accordance with organisational processes

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ELEMENT	PERFORMANCE CRITERIA
	1.4 Facilitate consultation processes to allow employees to contribute to issues related to their work, and promptly communicate outcomes of consultation to the work team 1.5 Promptly deal with and resolve issues raised, or refer them to relevant personnel
2 Encourage trust and confidence	2.1 Treat people with integrity, respect and empathy 2.2 Encourage effective relationships within the framework of the organisation's social, ethical and business standards 2.3 Gain and maintain the trust and confidence of colleagues, customers and suppliers through competent performance 2.4 Adjust interpersonal styles and methods in relation to the organisation's social and cultural environment
3 Identify and use networks and relationships	3.1 Identify and utilise workplace networks to help build relationships 3.2 Identify and describe the value and benefits of networks and other work relationships for the team and the organisation
4 Contribute to positive outcomes	4.1 Identify difficulties and take action to rectify the situation within own level of responsibility according to organisational and legal requirements 4.2 Support colleagues in resolving work difficulties 4.3 Regularly review workplace outcomes and implement improvements in consultation with relevant personnel 4.4 Identify and resolve poor work performance within own level of responsibility and according to organisational policies 4.5 Deal constructively with conflict, within the organisation's established processes

Foundation Skills

This section describes language, literacy, numeracy and employment skills incorporated in the performance criteria that are required for competent performance.

Skill	Performance Criteria	Description
Reading	1.1, 1.3, 1.4, 1.5, 4.3	• Comprehends textual information to determine regulatory requirements and adhere to job processes

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		and internal policies
Writing	1.1-1.5, 4.3, 4.4, 4.5	• Uses appropriate language to record key information related to the outcomes of the job • Varies writing style to meet requirements of audience and purpose
Oral Communication	1.2-1.5, 2.1, 2.2, 2.4, 3.1, 4.2-4.5	• Speaks clearly using tone and pace appropriate for the audience and purpose • Uses appropriate techniques, including active listening and questioning, to clarify information and to confirm understanding
Navigate the world of work	1.3, 2.1, 2.2, 2.4, 4.1, 4.4, 4.5	• Takes personal responsibility for adherence to explicit and implicit organisational policies, procedures, standards and legislative requirements within own job role and in all interactions with others
Interact with others	1.2, 1.3, 1.4, 1.5 2.1, 2.2, 2.3, 2.4 4.2, 4.3, 4.4, 4.5	• Selects and uses appropriate conventions and protocols when communicating with internal and external stakeholders to build rapport, establish networks, seek or share information, • Adjusts personal communication style in response to a diverse range of individuals in the work context • Uses collaborative techniques to engage team members in consultations and negotiations • Implements strategies to respond appropriately to conflict and poor work performance
Get the work done	1.1, 1.3, 1.4,1.5, 2.3, 3.1, 3.2, 4.1, 4.2, 4.3, 4.4	• Takes responsibility for planning, sequencing and prioritising tasks and own workload for effective outcomes • Uses formal analytical thinking techniques and broad ranging consultative processes to identify issues and implement a constructive approach to solutions and improvement opportunities • Uses familiar digital technologies and systems to access, present and communicate information

Unit Mapping Information

Code and title current version	**Code and title previous version**	**Comments**	**Equivalence status**
BSBFLM303 Contribute to effective workplace	BSBFLM303C Contribute to effective workplace	Updated to meet Standards for Training Packages	Equivalent unit

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Code and title current version	Code and title previous version	Comments	Equivalence status
relationships	relationships		

Links

Companion Volume implementation guides are found in VETNet - https://vetnet.gov.au/Pages/TrainingDocs.aspx?q=11ef6853-ceed-4ba7-9d87-4da407e23c10

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Assessment Requirements for BSBFLM303 Contribute to effective workplace relationships

Modification History

Release	Comments
Release 1	This version first released with BSB Business Services Training Package Version 1.0.

Performance Evidence

Evidence of the ability to:

- access and analyse information to achieve planned outcomes
- apply techniques for resolving problems and conflicts and dealing with poor performance within organisational and legislative requirements
- review and improve workplace outcomes in consultation with relevant personnel
- adjust interpersonal style and communications to respond to cultural and social diversity
- apply relationship management and communication skills with a range of people that:
  - demonstrate integrity, respect, empathy and cultural sensitivity and promote trust
  - forge effective relationships with internal and/or external people and help to maintain these networks
  - encourage participation and foster contribution of and respect for ideas and feedback
  - provide support to colleagues to resolve difficulties.
- communicate ideas and information to diverse audiences
- develop networks and build team relationships.

Note: If a specific volume or frequency is not stated, then evidence must be provided at least once.

Knowledge Evidence

To complete the unit requirements safely and effectively, the individual must:

- give examples of how work relationships and the cultural and social environment can support or hinder achieving planned outcomes
- explain techniques for developing positive work relationships and building trust and confidence in a team
- identify relevant legislation from all levels of government that affects business operation

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- describe a range of methods and techniques for communicating information and ideas to a range of stakeholders
- outline problems solving methods
- explain methods to resolve workplace conflict
- explain methods to manage poor work performance
- explain how to monitor, analyse and introduce ways to improve work relationships.

Assessment Conditions

Assessment must be conducted in a safe environment where evidence gathered demonstrates consistent performance of typical activities experienced in the management field of work and include access to:

- relevant legislation and regulations
- relevant workplace documentation and resources
- case studies and, where possible, real situations
- interaction with others.

Assessors must satisfy NVR/AQTF assessor requirements.

Links

Companion Volume implementation guides are found in VETNet - https://vetnet.gov.au/Pages/TrainingDocs.aspx?q=11ef6853-ceed-4ba7-9d87-4da407e23c10

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BSBFLM305 Support operational plan

Modification History

Release	Comments
Release 1	This version first released with BSB Business Services Training Package Version 1.0.

Application

This unit describes the skills and knowledge required to provide support for operational practices and procedures within the organisation's productivity and profitability plans. This includes contributing to the operational plan, assisting in recruiting employees and acquiring resources, and monitoring and adjusting operational performance.

It applies to individuals who use planning and analytical skills to achieve the measurable, stated objectives of the team and the organisation. At this level, work will normally be carried out within known routines, methods and procedures, and may also involve a number of complex or non-routine activities that require some discretion and judgement.

No licensing, legislative, regulatory or certification requirements apply to this unit at the time of publication.

Unit Sector

Management and Leadership – Frontline Management

Elements and Performance Criteria

ELEMENT	PERFORMANCE CRITERIA
Elements describe the essential outcomes.	*Performance criteria describe the performance needed to demonstrate achievement of the element.*
1 Contribute to implementation of operational plan	1.1 Collect and record details of resource requirements and report to relevant personnel 1.2 Ensure the operational plan contributes to the achievement of the organisation's performance and business plan 1.3 Identify key performance indicators to measure own and work

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ELEMENT	PERFORMANCE CRITERIA
	team's performance 1.4 Undertake contingency planning as required 1.5 Support the development and presentation of proposals for resource requirements as necessary
2 Assist in recruiting employees and acquiring resources	2.1 Assist with employee recruitment and/or induction as required, within the organisation's policies, practices and procedures 2.2 Acquire physical resources and services according to the organisation's policies, practices and procedures, and in consultation with relevant personnel
3 Support operations	3.1 Identify and utilise performance systems and processes to assess team progress in achieving plans and targets 3.2 Compare actual productivity and performance with identified short-term budgets, targets and performance results 3.3 Identify and report unsatisfactory performance to relevant personnel, to enable action to be taken to rectify situation 3.4 Provide coaching to support individuals and teams to use resources effectively, economically and safely 3.5 Support consultation processes for development and/or variation of the operational plan as required 3.6 Present recommendations for variation to operational plans to relevant personnel 3.7 Follow performance systems, procedures and recording processes in accordance with organisation requirements

Foundation Skills

This section describes language, literacy, numeracy and employment skills incorporated in the performance criteria that are required for competent performance.

Skill	Performance Criteria	Description
Learning	3.4	• Contributes to ongoing organisational improvement by training others to uses resources appropriately
Reading	1.1-1.3, 2.1, 2.2, 3.1, 3.2, 3.7	• Interprets information from a range of familiar texts

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Writing	1.1, 1.4, 1.5, 3.3, 3.6	• Uses appropriate vocabulary and grammatical structures to achieve precise meaning in a range of documentation
Oral Communication	1.1, 2.1, 2.2, 3.3-3.6	• Articulates information concisely using appropriate terminology, tone and style • Uses questioning and listening techniques to exchange and clarify information
Numeracy	1.1, 1.2, 2.2, 3.2, 3.4	• Interprets and analyses numerical information to support resource acquisition and broader business plan
Navigate the world of work	2.1, 2.2, 3.7	• Adheres to organisational policies and procedures and understands and meets expectations associated with own role
Interact with others	1.5, 2.1, 3.4-3.6	• Selects and uses appropriate conventions and protocols when communicating with relevant personnel • Collaborates and cooperates with others to achieve joint outcomes
Get the work done	1.1-1.4, 3.1, 3.3	• Takes responsibility for planning, sequencing and prioritising tasks and own workload for effective outcomes • Makes routine decisions and implements standard procedures for routine tasks • Recognises and responds to predictable routine problems related to role in the immediate work context

Unit Mapping Information

Code and title current version	**Code and title previous version**	**Comments**	**Equivalence status**
BSBFLM305 Support operational plan	BSBFLM305C Support operational plan	Updated to meet Standards for Training Packages	Equivalent unit

Links

Companion Volume implementation guides are found in VETNet - https://vetnet.gov.au/Pages/TrainingDocs.aspx?q=11ef6853-ceed-4ba7-9d87-4da407e23c10

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Assessment Requirements for BSBFLM305 Support operational plan

Modification History

Release	Comments
Release 1	This version first released with BSB Business Services Training Package Version 1.0.

Performance Evidence

Evidence of the ability to:

- assist in planning resource acquisition and usage including human resources, risk management and contingency planning
- share information and support members of the work team to achieve plans and targets
- monitor, analyse and report individual and team performance against identified targets.

Note: If a specific volume or frequency is not stated, then evidence must be provided at least once.

Knowledge Evidence

To complete the unit requirements safely and effectively, the individual must:

- explain the processes used to plan and acquire resources
- summarise organisational recruitment and induction processes
- explain the relationship between key performance indicators and achievement of the operational plan
- explain the role of contingency planning in supporting the operational plan
- identify systems and processes for monitoring and reporting performance
- identify alternative approaches to improving resource usage and eliminating resource inefficiencies and waste
- identify relevant legislation, regulations, standards or codes of practice that may affect the operational plan
- identify the organisational policies, practices and procedures relevant to implementation of the operational plan.

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Assessment Conditions

Assessment must be conducted in a safe environment where evidence gathered demonstrates consistent performance of typical activities experienced in the management field of work and include access to:

- relevant legislation and regulations
- relevant workplace documentation and resources
- case studies and, where possible, real situations
- interaction with others.

Assessors must satisfy NVR/AQTF assessor requirements.

Links

Companion Volume implementation guides are found in VETNet - https://vetnet.gov.au/Pages/TrainingDocs.aspx?q=11ef6853-ceed-4ba7-9d87-4da407e23c10

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BSBFLM306 Provide workplace information and resourcing plans

Modification History

Release	Comments
Release 1	This version first released with BSB Business Services Training Package Version 1.0.

Application

This unit describes the skills and knowledge required to support the information management system. It involves the identification, acquisition, initial analysis and use of appropriate workplace information.

It applies to individuals who use organisational and analytical skills to support business and resource planning processes. At this level, work will normally be carried out within known routines, methods and procedures, and may also involve a number of complex or non-routine activities that require some discretion and judgement.

No licensing, legislative or certification requirements apply to this unit at the time of publication.

Unit Sector

Management and Leadership – Frontline Management

Elements and Performance Criteria

ELEMENT	PERFORMANCE CRITERIA
Elements describe the essential outcomes.	*Performance criteria describe the performance needed to demonstrate achievement of the element.*
1 Locate relevant information	1.1 Identify and locate information required by teams 1.2 Acquire and review information according to organisational procedures 1.3 Apply plans and procedures to obtain information which is not immediately available/accessible

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ELEMENT	PERFORMANCE CRITERIA
2 Collect and report information	2.1 Collect information relevant to the needs of teams in an adequate and timely manner 2.2 Ensure information acquired is in a format suitable for analysis, interpretation and dissemination 2.3 Use information to identify and report relevant trends and developments to relevant personnel, within the limits of own role
3 Use information systems	3.1 Effectively use management information systems to store and retrieve data 3.2 Use available technology to manage information effectively 3.3 Report recommendations for improving information system to designated persons and/or groups
4 Support preparation of business plan and/or budgets	4.1 Effectively utilise the contribution of the work team when preparing business plans and/or budgets to gain support for outcomes 4.2 Present and record information to support preparation of business plans and/or budgets in accordance with organisation's guidelines and requirements 4.3 Follow contingency plans when alternative action is required
5 Support preparation of resource proposals	5.1 Consult with colleagues to collect resource planning data as required 5.2 Report estimated resource needs and usage according to organisational requirements as necessary 5.3 Facilitate resourcing within limits of own role

Foundation Skills

This section describes language, literacy, numeracy and employment skills incorporated in the performance criteria that are required for competent performance.

Skill	Performance Criteria	Description
Reading	1.1-1.3, 2.1-2.3, 3.1, 4.2, 4.3, 5.2	• Interprets information from a range of familiar texts including organisational policies and procedures
Writing	2.2, 2.3, 3.1, 3.3,	• Uses appropriate vocabulary and formats to achieve precise meaning in a range of documentation

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	4.1, 4.2, 5.2	
Oral Communication	2.3, 3.3, 4.1, 5.1	• Provides information using terminology and style appropriate to context and audience • Uses questioning and listening techniques to exchange and clarify information
Numeracy	1.1, 1.2, 2.1-2.3, 4.1, 4.2, 5.1, 5.2	• Interprets and analyses numerical information to identify budgetary requirements
Navigate the world of work	1.2, 1.3, 4.2, 5.2	• Adheres to organisational protocols and procedures and understands the nature and purpose of own role and associated responsibilities
Interact with others	3.3, 5.1	• Selects the appropriate form, channel and mode of communication for a specific purpose relevant to own role • Seeks to cooperate with others to achieve results in immediate work context
Get the work done	1.1, 1.3, 2.1, 2.2, 3.1-3.3, 4.1, 4.3, 5.1, 5.3	• Takes responsibility for planning and organising tasks required to achieve required outcomes • Makes routine decisions based on implementation of standard plans and procedures • Collects and analyses information efficiently to develop recommendations for improvements and perform resourcing tasks • Uses digital systems and tools to access, store and retrieve data and manage information

Unit Mapping Information

Code and title current version	**Code and title previous version**	**Comments**	**Equivalence status**
BSBFLM306 Provide workplace information and resourcing plans	BSBFLM306C Provide workplace information and resourcing plans	Updated to meet Standards for Training Packages	Equivalent unit

Links

Companion Volume implementation guides are found in VETNet - https://vetnet.gov.au/Pages/TrainingDocs.aspx?q=11ef6853-ceed-4ba7-9d87-4da407e23c10

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Assessment Requirements for BSBFLM306 Provide workplace information and resourcing plans

Modification History

Release	Comments
Release 1	This version first released with BSB Business Services Training Package Version 1.0.

Performance Evidence

Evidence of the ability to:

- use management information system to collect, store and retrieve data to support the preparation of business plans and/or budgets
- involve the work team in planning and budget preparation
- estimate resource needs and usage according to organisational requirements and allocating or acquiring resources within limits of own role.

Note: If a specific volume or frequency is not stated, then evidence must be provided at least once.

Knowledge Evidence

To complete the unit requirements safely and effectively, the individual must:

- describe information contained in management information systems
- discuss basic financial concepts relating to operational plans and budgets
- list the main requirements of a business plan
- outline data required to prepare resource proposals
- outline methods to gain efficiencies in operational resource management.

Assessment Conditions

Assessment must be conducted in a safe environment where evidence gathered demonstrates consistent performance of typical activities experienced in the management field of work and include access to:

- relevant workplace documentation and resources
- case studies and, where possible, real situations
- interaction with others
- business technology.

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Assessors must satisfy NVR/AQTF assessor requirements.

Links

Companion Volume implementation guides are found in VETNet - https://vetnet.gov.au/Pages/TrainingDocs.aspx?q=11ef6853-ceed-4ba7-9d87-4da407e23c10

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BSBFLM309 Support continuous improvement systems and processes

Modification History

Release	Comments
Release 1	This version first released with BSB Business Services Training Package Version 1.0.

Application

This unit describes the skills and knowledge required to support the organisation's continuous improvement systems and processes. Particular emphasis is on actively encouraging the team to participate in the process, monitoring and reporting on specified outcomes and supporting opportunities for further improvements.

It applies to individuals with roles of responsibility who use initiative, organisational and communication skills to influence the ongoing development of the organisation.

At this level, work will normally be carried out within known routines, methods and procedures, and may also involve complex or non-routine activities that require some discretion and judgement.

No licensing, legislative or certification requirements apply to this unit at the time of publication.

Unit Sector

Management and Leadership – Frontline Management

Elements and Performance Criteria

ELEMENT	PERFORMANCE CRITERIA
Elements describe the essential outcomes.	*Performance criteria describe the performance needed to demonstrate achievement of the element.*
1 Contribute to continuous improvement systems and processes	1.1 Actively encourage and support team members to participate in decision-making processes and to assume responsibility and exercise initiative

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ELEMENT	PERFORMANCE CRITERIA
	1.2 Communicate the organisation's continuous improvement processes to individuals and teams 1.3 Effectively utilise mentoring and coaching to ensure that individuals/teams are able to support the organisation's continuous improvement processes
2 Monitor and report specified outcomes	2.1 Utilise the organisation's systems and technology to monitor team progress and to identify ways in which planning and operations could be improved 2.2 Apply continuous improvement techniques and processes to improve customer service
3 Support opportunities for further improvement	3.1 Communicate agreed recommendations for improvements in achieving the business plan to team members 3.2 Document and use work performance to identify opportunities for further improvement 3.3 Maintain records, reports and recommendations for improvement within the organisation's systems and processes

Foundation Skills

This section describes language, literacy, numeracy and employment skills incorporated in the performance criteria that are required for competent performance.

Skill	Performance Criteria	Description
Learning	1.3	• Contributes to ongoing organisational improvement by mentoring others to support continuous improvement processes
Reading	2.1, 3.3	• Interprets everyday workplace documentation
Writing	1.2, 3.1-3.3	• Uses appropriate vocabulary and grammatical structures to achieve precise meaning in a range of documentation
Oral Communication	1.1-1.3, 3.1	• Articulates information in a positive manner using appropriate terminology, tone and style appropriate to context and audience • Uses questioning and listening techniques to exchange and clarify information

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Navigate the world of work	1.2, 3.3	• Understands the nature and purpose of own role and associated responsibilities and how own role meshes with others and contributes to broader work goals • Takes responsibility for adherence to organisational processes and systems
Interact with others	1.2, 1.3	• Shares information and resources, offers assistance voluntarily and facilitates effective group interactions
Get the work done	2.1, 2.2, 3.2, 3.3	• Takes responsibility for routine low-impact decisions within familiar situations • Evaluates effectiveness of decisions in terms of how well they meet stated goals • Uses a range of digitally based technology and applications to organise, monitor, manage and communicate relevant information effectively

Unit Mapping Information

Code and title current version	**Code and title previous version**	**Comments**	**Equivalence status**
BSBFLM309 Support continuous improvement systems and processes	BSBFLM309C Support continuous improvement systems and processes	Updated to meet Standards for Training Packages	Equivalent unit

Links

Companion Volume implementation guides are found in VETNet - https://vetnet.gov.au/Pages/TrainingDocs.aspx?q=11ef6853-ceed-4ba7-9d87-4da407e23c10

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Assessment Requirements for BSBFLM309 Support continuous improvement systems and processes

Modification History

Release	Comments
Release 1	This version first released with BSB Business Services Training Package Version 1.0.

Performance Evidence

Evidence of the ability to:

- perform actions to support continuous improvement including:
  - using work performance to identify improvement
  - adjusting plans to reflect changes
  - communicating effectively with all stakeholders
  - using technology to monitor operational progress
  - applying suitable recordkeeping processes.

Note: If a specific volume or frequency is not stated, then evidence must be provided at least once.

Knowledge Evidence

To complete the unit requirements safely and effectively, the individual must:

- explain principles and techniques relating to:
  - continuous improvement systems and processes
  - benchmarking
  - best practice
- describe the benefits of continuous improvement
- list quality approaches which the organisation may implement
- explain methods that can be used in continuous improvement
- outline barriers to continuous improvement
- explain recording, reporting and recommendation processes to facilitate continuous improvement applied within the organisation.

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Assessment Conditions

Assessment must be conducted in a safe environment where evidence gathered demonstrates consistent performance of typical activities experienced in the management field of work and include access to:

- relevant workplace documentation and resources
- case studies and, where possible, real situations
- interaction with others
- business technology.

Assessors must satisfy NVR/AQTF assessor requirements.

Links

Companion Volume implementation guides are found in VETNet - https://vetnet.gov.au/Pages/TrainingDocs.aspx?q=11ef6853-ceed-4ba7-9d87-4da407e23c10

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BSBFLM311 Support a workplace learning environment

Modification History

Release	Comments
Release 1	This version first released with BSB Business Services Training Package Version 1.0.

Application

This unit describes the skills and knowledge required to effectively encourage and support a learning environment. Particular emphasis is on participation in processes to facilitate and promote learning and to monitor and improve learning performance.

It applies to individuals who use initiative and well-developed planning and communication skills in their role. At this level, work will normally be carried out within known routines, methods and procedures, and may also involve complex or non-routine activities that require some discretion and judgement.

No licensing, legislative or certification requirements apply to this unit at the time of publication.

Unit Sector

Management and Leadership – Frontline Management

Elements and Performance Criteria

ELEMENT	PERFORMANCE CRITERIA
Elements describe the essential outcomes.	*Performance criteria describe the performance needed to demonstrate achievement of the element.*
1 Encourage a learning environment	1.1 Encourage and support workplace learning opportunities 1.2 Implement learning plans as an integral part of individual and team performance plans 1.3 Implement learning plans to reflect diversity of needs and learning opportunities 1.4 Encourage individual and team to access and participate in

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ELEMENT	PERFORMANCE CRITERIA
	learning opportunities 1.5 Liaise effectively with training and development specialists to contribute to learning opportunities which enhance individual, team and organisational performance
2 Encourage and promote learning for team and individuals	2.1 Promote a learning culture within the team and organisation 2.2 Support coaching and mentoring for the development of workplace knowledge, skills and attitudes 2.3 Encourage team members to assess own competencies, and to identify own learning and development needs 2.4 Share the benefits of learning with others in the team and organisation 2.5 Provide recognition and feedback for workplace achievement in a timely and appropriate manner
3 Identify opportunities for improvement	3.1 Monitor the performance of individuals and teams to determine the type and extent of required work-based support 3.2 Gather feedback from individuals and teams to identify opportunities for improving future learning arrangements 3.3 Negotiate adjustments with training and development specialists to improve the efficiency and effectiveness of learning 3.4 Document and report learning outcomes in accordance with the organisation's systems and procedures

Foundation Skills

This section describes language, literacy, numeracy and employment skills incorporated in the performance criteria that are required for competent performance.

Skill	Performance Criteria	Description
Learning	1.1, 1.2, 2.1, 3.2	• Plans and implements learning processes • Encourages learning outcomes in a team environment
Reading	1.2, 1.3, 3.2, 3.4	• Interprets information from a range of familiar texts including everyday workplace documentation
Writing	1.2, 1.3, 2.5, 3.4	• Uses appropriate vocabulary, grammatical structures and conventions to communicate information,

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		matching style to purpose and audience
Oral Communication	1.1, 1.4, 1.5, 2.1-2.5, 3.2-3.4	• Presents ideas and seeks feedback from others using appropriate vocabulary and non-verbal features • Participates in open discussions to elicit the views of others by asking questions and listening to responses
Navigate the world of work	3.4	• Adheres to organisational policies and procedures
Interact with others	1.1, 1.4, 1.5, 2.1-2.5, 3.2, 3.3	• Varies content and style of interactions to suit the needs of various audiences and to achieve a desired outcomes • Uses effective interpersonal skills to support and encourage workplace learning and sharing of knowledge and skills
Get the work done	1.2, 1.3, 2.5, 3.1, 3.2	• Takes personal responsibility for planning and organising tasks required to achieve required outcomes

Unit Mapping Information

Code and title current version	**Code and title previous version**	**Comments**	**Equivalence status**
BSBFLM311 Support a workplace learning environment	BSBFLM311C Support a workplace learning environment	Updated to meet Standards for Training Packages	Equivalent unit

Links

Companion Volume implementation guides are found in VETNet - https://vetnet.gov.au/Pages/TrainingDocs.aspx?q=11ef6853-ceed-4ba7-9d87-4da407e23c10

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Assessment Requirements for BSBFLM311 Support a workplace learning environment

Modification History

Release	Comments
Release 1	This version first released with BSB Business Services Training Package Version 1.0.

Performance Evidence

Evidence of the ability to:

- liaise with workplace personnel to develop, implement and support learning in the workplace
- identify learning needs, develop learning plans and arrange learning opportunities
- compile and interpret data about learning arrangements and outcomes in accordance with organisational requirements.

Note: If a specific volume or frequency is not stated, then evidence must be provided at least once.

Knowledge Evidence

To complete the unit requirements safely and effectively, the individual must:

- summarise important considerations in an adult learning environment
- explain the differences and similarities between coaching and mentoring
- outline workplace learning principles and the organisational policies and procedures for applying learning systems.
- describe different types of learning opportunities that could be provided the workplace.

Assessment Conditions

Assessment must be conducted in a safe environment where evidence gathered demonstrates consistent performance of typical activities experienced in the management field of work and include access to:

- relevant workplace documentation and resources
- case studies and, where possible, real situations
- interaction with others.

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Assessors must satisfy NVR/AQTF assessor requirements.

Links

Companion Volume implementation guides are found in VETNet - https://vetnet.gov.au/Pages/TrainingDocs.aspx?q=11ef6853-ceed-4ba7-9d87-4da407e23c10

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BSBFLM312 Contribute to team effectiveness

Modification History

Release	Comments
Release 1	This version first released with BSB Business Services Training Package Version 1.0.

Application

This unit describes the skills and knowledge required to contribute to the effectiveness of the work team. It involves planning with the team to meet expected outcomes, developing team cohesion, participating in and facilitating the work team, and communicating with the management of the organisation.

It applies to individuals who play a prominent part in motivating, mentoring, coaching and developing team cohesion through team leadership and forming the link between the management of the organisation and the team members. At this level, work will normally be carried out within known routines, methods and procedures, and may also involve complex or non-routine activities that require some discretion and judgement.

No licensing, legislative or certification requirements apply to this unit at the time of publication.

Unit Sector

Management and Leadership – Frontline Management

Elements and Performance Criteria

ELEMENT	PERFORMANCE CRITERIA
Elements describe the essential outcomes.	*Performance criteria describe the performance needed to demonstrate achievement of the element.*
1 Contribute to team outcomes	1.1 Consult team members to identify team purpose, roles, responsibilities, goals, plans and objectives 1.2 Support team members to meet expected outcomes

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ELEMENT	PERFORMANCE CRITERIA
2 Support team cohesion	2.1 Encourage team members to participate in the planning, decision making and operational aspects of the work team to their level of responsibility 2.2 Encourage team members to take responsibility for their own work and to assist each other in undertaking required roles and responsibilities 2.3 Provide feedback to team members to encourage, value and reward team members' efforts and contributions 2.4 Identify and address issues, concerns and problems identified by team members, or refer to relevant persons as required
3 Participate in work team	3.1 Actively encourage and support team members to participate in team activities and communication processes and to take responsibility for their actions 3.2 Support the team to identify and resolve problems which impede its performance 3.3 Utilise own contribution to work team to serve as a role model for others and enhance the organisation's image within the work team, the organisation and with clients/customers
4 Communicate with management	4.1 Maintain open communication with line manager/management at all times 4.2 Communicate information from line manager/management to the team 4.3 Communicate unresolved issues to line manager/management and follow up to ensure action is taken in response to these matters

Foundation Skills

This section describes language, literacy, numeracy and employment skills incorporated in the performance criteria that are required for competent performance.

Skill	Performance Criteria	Description
Writing	2.3, 2.4, 4.2, 4.3	• Uses appropriate vocabulary, grammatical structures and conventions to communicate information, matching style to purpose and audience
Oral	1.1, 1.2, 2.1-2.4, 3.1,	• Presents ideas and seeks feedback from others using vocabulary and non-verbal features appropriate to the

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Communication	3.2, 4.1-4.3	audience • Participates in open discussions to elicit the views of others by asking questions and listening to responses
Navigate the world of work	1.1	• Ensures that team members are aware of their rights and responsibilities in the workplace, including workplace safety
Interact with others	1.1, 1.2, 2.1-2.4, 3.1, 3.2, 4.1-4.3	• Collaborates, supports and cooperates with others to achieve work outcomes, and encourages others to do the same • Selects the appropriate form, channel and mode of communication for a specific purpose relevant to own role • Recognises importance of own interpersonal skills in projecting a positive image to others in work context • Understands the need to modify own communication style to accommodate individual differences
Get the work done	1.1, 2.4, 4.1, 4.3	• Plans and implements tasks required to achieve required outcomes • Recognises and responds to problems related to role and seeks assistance when problems are beyond immediate responsibilities

Unit Mapping Information

Code and title current version	**Code and title previous version**	**Comments**	**Equivalence status**
BSBFLM312 Contribute to team effectiveness	BSBFLM312C Contribute to team effectiveness	Updated to meet Standards for Training Packages	Equivalent unit

Links

Companion Volume implementation guides are found in VETNet - https://vetnet.gov.au/Pages/TrainingDocs.aspx?q=11ef6853-ceed-4ba7-9d87-4da407e23c10

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Assessment Requirements for BSBFLM312 Contribute to team effectiveness

Modification History

Release	Comments
Release 1	This version first released with BSB Business Services Training Package Version 1.0.

Performance Evidence

Evidence of the ability to:

- discuss and clarify goals and responsibilities with a team of people
- apply management and communication skills with a range of people that:
  - provides direction and leadership
  - assists individuals to achieve goals
  - motivates and builds team cohesion
  - fosters contribution of and respect for ideas
- apply techniques for resolving problems within organisational and legislative requirements
- communicate effectively with management including escalating problems outside own area of responsibility
- manage communication of information to, and between, the team.

Note: If a specific volume or frequency is not stated, then evidence must be provided at least once.

Knowledge Evidence

To complete the unit requirements safely and effectively, the individual must:

- list organisational goals, objectives and plans that relate to the team
- identify legislation, regulations, standards or codes of practice that may impact team performance and outcomes
- describe the organisational structure with reference to the organisational chart
- describe options for addressing performance issues in the organisation
- explain the principles and techniques of:
  - group dynamics and processes
  - motivation

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  - negotiation
- explain why considering individual behaviour and differences is important to a manager.

Assessment Conditions

Assessment must be conducted in a safe environment where evidence gathered demonstrates consistent performance of typical activities experienced in the management field of work and include access to:

- relevant workplace documentation and resources
- relevant legislation
- case studies and, where possible, real situations
- interaction with others.

Assessors must satisfy NVR/AQTF assessor requirements.

Links

Companion Volume implementation guides are found in VETNet - https://vetnet.gov.au/Pages/TrainingDocs.aspx?q=11ef6853-ceed-4ba7-9d87-4da407e23c10

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BSBINM401 Implement workplace information system

Modification History

Release	Comments
Release 1	This version first released with BSB Business Services Training Package Version 1.0.

Application

This unit describes the skills and knowledge required to implement and review the workplace information system. It involves the identification, acquisition, initial analysis and use of appropriate information which plays a significant part in the organisation's effectiveness.

It applies to individuals whose work will normally be carried out within routine and non-routine methods and procedures which require planning and evaluation, leadership and guidance of others, and some discretion and judgement.

No licensing, legislative or certification requirements apply to this unit at the time of publication.

Unit Sector

Knowledge Management – Information Management

Elements and Performance Criteria

ELEMENT	PERFORMANCE CRITERIA
Elements describe the essential outcomes.	*Performance criteria describe the performance needed to demonstrate achievement of the element.*
1 Identify and source information needs	1.1 Determine and locate information required by teams 1.2 Acquire and review information held by the organisation to determine suitability, accessibility, currency and reliability according to organisational policies
2 Collect, analyse and report information	2.1 Collect information, which is adequate and relevant to the needs of teams, in a timely manner

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ELEMENT	PERFORMANCE CRITERIA
	2.2 Ensure information is in a format suitable for analysis, interpretation and dissemination 2.3 Analyse information to identify and report relevant trends and developments in terms of the needs for which it was acquired
3 Implement information systems	3.1 Implement management information systems effectively to store, retrieve and regularly review data for decision making purposes 3.2 Use technology available in the work area to manage information effectively 3.3 Submit recommendations for improving the information system to designated persons and/or groups
4 Prepare for information system changes	4.1 Collect information about information system future needs in consultation with colleagues, including those who have a specialist role in resource management 4.2 Ensure estimates of information system future needs reflect the organisation's business plans, and customer and supplier requirements 4.3 Support proposals to secure resources by clearly presenting submissions that describe realistic options, benefits, costs and outcomes 4.4 Prepare team members to work with new technology and information system changes

Foundation Skills

This section describes language, literacy, numeracy and employment skills incorporated in the performance criteria that are required for competent performance.

Skill	Performance Criteria	Description
Reading	1.1, 1.2, 2.1, 2.2, 2.3, 3.1, 3.2, 3.3, 4.1, 4.2, 4.3, 4.4	• Critically analyses complex documentation from a variety of sources and consolidates information relating to specific criteria to determine requirements
Writing	1.2, 2.1, 2.3, 3.1, 3.3, 4.1, 4.2, 4.3, 4.4	• Develops material for a specific audience using clear and detailed language in order to convey explicit information, requirements and recommendations
Oral	1.1, 3.3, 4.1, 4.3, 4.4	• Uses active listening and questioning and reading of verbal and non-verbal signals to convey and clarify

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Communication		information and to confirm understanding
Numeracy	4.1-4.3	• Selects from and uses a variety of developing mathematical and problem solving strategies to ensure estimates of information reflect the business plan and staff requirements
Navigate the world of work	1.2	• Takes responsibility for following policies, procedures and legislative requirements and identifies organisational implications of new legislation or regulation
Interact with others	1.1, 3.3, 4.1, 4.3, 4.4	• Selects and uses appropriate conventions and protocols when communicating with clients and co-workers in a range of work contexts • Cooperates with others and contributes to work practices where joint outcomes are expected and deadlines are to be met
Get the work done	1.1, 1.2, 2.1, 2.3, 3.1, 3.2, 4.1, 4.2	• Takes responsibility for planning, sequencing and prioritising tasks and own workload for efficiency and effective outcomes • Contributes to continuous improvement of current work practices by applying basic principles of analytical thinking • Uses familiar digital technologies and systems to access, enter, present and communicate data and information

Unit Mapping Information

Code and title current version	**Code and title previous version**	**Comments**	**Equivalence status**
BSBINM401 Implement workplace information system	BSBINM401A Implement workplace information system	Updated to meet Standards for Training Packages	Equivalent unit

Links

Companion Volume implementation guides are found in VETNet - https://vetnet.gov.au/Pages/TrainingDocs.aspx?q=11ef6853-ceed-4ba7-9d87-4da407e23c10

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Assessment Requirements for BSBINM401 Implement workplace information system

Modification History

Release	Comments
Release 1	This version first released with BSB Business Services Training Package Version 1.0.

Performance Evidence

Evidence of the ability to:

- identify, source and analyse information to determine
  - information system needs
  - whether it is fit for purpose
  - trends and developments
- implement and review the workplace information system
- review a workplace information system and prepare and present a submission recommending improvements.

Note: If a specific volume or frequency is not stated, then evidence must be provided at least once.

Knowledge Evidence

To complete the unit requirements safely and effectively, the individual must:

- identify the information systems that are, or should be, available in the workplace
- explain the information management systems and technology typically associated with the workplace including:
  - budgets and financial management systems
  - customer information software or records
  - databases
  - personal digital assistant (PDA)
  - product and service information
  - project management software
  - record management systems
  - spreadsheets.

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Assessment Conditions

Assessment must be conducted in a safe environment where evidence gathered demonstrates consistent performance of typical activities experienced in the knowledge management – information management field of work and include access to:

- business technology
- a workplace information system
- workplace policies and procedures.

Assessors must satisfy NVR/AQTF assessor requirements.

Links

Companion Volume implementation guides are found in VETNet - https://vetnet.gov.au/Pages/TrainingDocs.aspx?q=11ef6853-ceed-4ba7-9d87-4da407e23c10

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BSBINM501 Manage an information or knowledge management system

Modification History

Release	Comments
Release 1	This version first released with BSB Business Services Training Package Version 1.0.

Application

This unit describes the skills and knowledge required to organise training for others for an information or knowledge management system and to manage the use of the system.

It applies to individuals who are responsible for seeing that key information and corporate knowledge are retained, accessible to others and improve business outcomes.

The unit applies to information or knowledge management systems which comprise policies, protocols, procedures and practices to manage information or knowledge within the organisation and among relevant stakeholders.

No licensing, legislative or certification requirements apply to this unit at the time of publication.

Unit Sector

Knowledge Management – Information Management

Elements and Performance Criteria

ELEMENT	PERFORMANCE CRITERIA
Elements describe the essential outcomes.	*Performance criteria describe the performance needed to demonstrate achievement of the element.*
1 Organise learning to use information or knowledge management system	1.1 Identify learning needs of relevant personnel and stakeholders for input into and use of an information or knowledge management system 1.2 Identify and secure human, financial and physical resources

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ELEMENT	PERFORMANCE CRITERIA
	required for learning activities to use an information or knowledge management system 1.3 Organise and facilitate learning activities 1.4 Promote and support use of the system throughout the organisation 1.5 Monitor and document effectiveness of learning activities
2 Manage use of information or knowledge management system	2.1 Ensure implementation of policies and procedures for the information or knowledge management system are monitored for compliance, effectiveness and efficiency 2.2 Address implementation issues and problems as they arise 2.3 Monitor integration and alignment with data and information systems 2.4 Collect information on achievement of performance measures 2.5 Manage contingencies such as system failure or technical difficulties by accessing technical specialist help as required
3 Review use of information or knowledge management system	3.1 Analyse effectiveness of system and report on strengths and limitations of the system 3.2 Review business and operational plan and determine how effectively the system is contributing to intended outcomes 3.3 Make recommendations for improvement to system, policy or work practices

Foundation Skills

This section describes language, literacy, numeracy and employment skills incorporated in the performance criteria that are required for competent performance.

Skill	Performance Criteria	Description
Reading	1.1-1.5, 2.1-2.5, 3.1-3.3	• Researches and critically analyses documentation from a variety of sources to determine requirements
Writing	1.1-1.5, 2.1-2.4, 3.2, 3.3	• Prepares and produces documentation for a specific audience using clear and detailed language to convey explicit information, requirements and recommendations

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Oral Communication	1.1, 1.2, 1.3, 1.4, 2.2, 2.5, 3.3	• Presents information using structure and language to suit the audience • Uses active listening and questioning and reading of verbal and non-verbal signals to clarify information and to confirm understanding
Navigate the world of work	2.1, 3.3	• Takes full responsibility for following policies, procedures and legislative requirements and identifies organisational implications of new legislation or regulation • Modifies or develops organisational policies and procedures to comply with legislative requirements and organisation goals
Interact with others	1.1-1.4, 2.5, 3.3	• Implements strategies for a diverse range of colleagues and clients in order to build rapport and foster strong relationships • Collaborates with others sharing information to build strong work groups and avoid behaviours that are not conducive to a productive environment • Elicits feedback and provides feedback to others in order to improve self or workgroup behaviours
Get the work done	1.1-1.5, 2.1-2.5, 3.1, 3.2	• Accepts responsibility for planning and sequencing complex tasks and workload, negotiating key aspects with others and taking into account capabilities, efficiencies and effectiveness • Monitors progress of plans and schedules and reviews and changes them to meet new demands and priorities • Applies systematic and analytical processes to address problems and make decisions in complex situations • Investigates new and innovative ideas as a means to continuously improve, work practices and processes • Uses and investigates new digital technologies and applications to manage and manipulate data and communicate effectively with others

Unit Mapping Information

Code and title current version	**Code and title previous version**	**Comments**	**Equivalence status**
BSBINM501 Manage an information or knowledge	BSBINM501A Manage an information or knowledge	Updated to meet Standards for Training Packages	Equivalent unit

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Code and title current version	Code and title previous version	Comments	Equivalence status
management system	management system		

Links

Companion Volume implementation guides are found in VETNet - https://vetnet.gov.au/Pages/TrainingDocs.aspx?q=11ef6853-ceed-4ba7-9d87-4da407e23c10

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Assessment Requirements for BSBINM501 Manage an information or knowledge management system

Modification History

Release	Comments
Release 1	This version first released with BSB Business Services Training Package Version 1.0.

Performance Evidence

Evidence of the ability to:

- identify learning needs and plan and implement learning activities to enable personnel to use information or knowledge management system including
  - providing human, financial and physical resources as required
  - use of coaching, mentoring, information sessions, workshops, training programs and e-learning as appropriate
- monitor performance and address issues and contingencies as they arise including
  - accessing technical specialists as required
  - correct application of policies and procedures for the information or knowledge management system
  - alignment and effectiveness of the policies and procedures
  - effectiveness of information or knowledge management system for intended outcomes
- recommend improvements to systems, policies and practices as appropriate.

Note: If a specific volume or frequency is not stated, then evidence must be provided at least once.

Knowledge Evidence

To complete the unit requirements safely and effectively, the individual must:

- outline relevant legislation, codes of practice and national standards relevant to privacy, freedom of information and knowledge management
- explain organisational policies and procedures including:
  - records management
  - information management
  - customer service
  - commercial confidentiality

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- describe the organisational operations and existing data and information systems.

Assessment Conditions

Assessment must be conducted in a safe environment where evidence gathered demonstrates consistent performance of typical activities experienced in the knowledge management – information management field of work and include access to:

- relevant legislation, regulation, standards and codes
- relevant workplace systems, documentation and resources
- case studies and, where possible, real situations
- interaction with others.

Assessors must satisfy NVR/AQTF assessor requirements.

Links

Companion Volume implementation guides are found in VETNet - https://vetnet.gov.au/Pages/TrainingDocs.aspx?q=11ef6853-ceed-4ba7-9d87-4da407e23c10

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BSBINN301 Promote innovation in a team environment

Modification History

Release	Comments
Release 1	This version first released with BSB Business Services Training Package Version 1.0.

Application

This unit describes the skills and knowledge required to be an effective and proactive member of an innovative team.

It applies to individuals who play a proactive role in demonstrating, encouraging or supporting innovation in a team environment. The individual may be a team participant or a team leader. Teams may be formal or informal and may comprise a range of personnel.

No licensing, legislative, regulatory or certification requirements apply to this unit at the time of publication.

Unit Sector

Creativity and Innovation – Innovation

Elements and Performance Criteria

ELEMENT	PERFORMANCE CRITERIA
Elements describe the essential outcomes.	*Performance criteria describe the performance needed to demonstrate achievement of the element.*
1 Create opportunities to maximise innovation within the team	1.1 Evaluate and reflect on what the team needs and wants to achieve 1.2 Check out information about current or potential team members' work in the context of developing a more innovative team 1.3 Bring people into the team or make suggestions for team members based on what needs to be achieved and the potential for cross fertilising ideas

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ELEMENT	PERFORMANCE CRITERIA
	1.4 Acknowledge, respect and discuss the different ways that people may contribute to building or enhancing the team
2 Organise and agree effective ways of working	2.1 Jointly establish ground rules for how the team will operate 2.2 Agree and communicate responsibilities in ways that encourage and reinforce team-based innovation 2.3 Agree and share tasks and activities to ensure the best use of skills and abilities within the team 2.4 Plan and schedule activities to allow time for thinking, challenging and collaboration 2.5 Establish personal reward and stimulation as an integral part of the team's way of working
3 Support and guide colleagues	3.1 Model behaviour that supports innovation 3.2 Seek external stimuli and ideas to feed into team activities 3.3 Proactively share information, knowledge and experiences with other team members 3.4 Challenge and test ideas within the team in a positive and collaborative way 3.5 Proactively discuss and explore ideas with other team members on an ongoing basis
4 Reflect on how the team is working	4.1 Debrief and reflect on activities and on opportunities for improvement and innovation 4.2 Gather and use feedback from within and outside the team to generate discussion and debate 4.3 Discuss the challenges of being innovative in a constructive and open way 4.4 Take ideas for improvement, build them into future activities and communicate key issues to relevant colleagues 4.5 Identify, promote and celebrate successes and examples of successful innovation

Foundation Skills

This section describes language, literacy, numeracy and employment skills incorporated in the performance criteria that are required for competent performance.

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Skill	Performance Criteria	Description
Reading	1.2, 4.2	• Interprets and analyses textual information, from a wide range of sources, to identify information relevant to team activities
Writing	2.2, 3.3, 4.4	• Uses clear language and formats appropriate for the audience to highlight and present specific information
Oral Communication	1.2, 1.3, 1.4, 2.1, 2.2, 3.5, 4.1, 4.2, 4.3, 4.4, 4.5	• Actively participates in verbal exchanges of ideas and elicits the views and opinions of team members by listening and questioning • Uses clear language to clarify rules and roles relating to team activities in formal and informal situations
Numeracy	1.2, 4.2	• Interprets numeric information relevant to team activities
Navigate the world of work	1.1, 3.1, 3.2, 3.5	• Understands the nature and purpose of own role and how it affects others in the work context
Interact with others	1.1-1.4, 2.1, 2.2, 3.1, 3.2, 3.4, 3.5, 4.1, 4.2, 4.4, 4.5	• Uses inclusive techniques to initiate, contribute and promote discussion amongst potentially diverse team members • Recognises the importance of establishing and building effective working relationships • Selects the appropriate form, channel and mode of communication for a specific purpose relevant to own role
Get the work done	1.3, 1.4, 2.2, 2.4, 2.5, 3.2, 3.4, 4.2, 4.4, 4.5	• Plans, sequences and prioritises tasks for efficient and effective outcomes • Contributes to continuous improvement of current work practices by applying basic principles of analytical and lateral thinking • Uses problem-solving processes to address less predictable problems, and when appropriate, seeking input from others • Reflects on outcomes and further explores own and the team’s role in implementing innovation

Unit Mapping Information

Code and title current version	Code and title previous version	Comments	Equivalence status

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Code and title current version	Code and title previous version	Comments	Equivalence status
BSBINN301 Promote innovation in a team environment	BSBINN301A Promote innovation in a team environment	Updated to meet Standards for Training Packages	Equivalent unit

Links

Companion Volume implementation guides are found in VETNet - https://vetnet.gov.au/Pages/TrainingDocs.aspx?q=11ef6853-ceed-4ba7-9d87-4da407e23c10

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Assessment Requirements for BSBINN301 Promote innovation in a team environment

Modification History

Release	Comments
Release 1	This version first released with BSB Business Services Training Package Version 1.0.

Performance Evidence

Evidence of the ability to:

- apply practices that promote innovation within a team including:
  - modelling open and respectful communications
  - contributing to the make-up and rules of the team
  - planning and scheduling of activities
  - reflecting on activities, feedback and challenges to identity improvement options
- encourage others to contribute to innovation in the team
- implement improvements and communicate about them.

Note: If a specific volume or frequency is not stated, then evidence must be provided at least once.

Knowledge Evidence

To complete the unit requirements safely and effectively, the individual must:

- explain what innovation is, the different types of innovation and the benefits of innovation
- describe the internal and external factors that contribute to a team becoming and remaining innovative including:
  - team characteristics
  - the role of group dynamics and diversity
  - broader environmental factors
- explain how activities can encourage or hinder innovation in a team including:
  - allocation of time and activities
  - modelling behaviour
  - rewards and recognition
  - communications

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- feedback.

Assessment Conditions

Assessment must be conducted in a safe environment where evidence gathered demonstrates consistent performance of typical activities experienced in the creativity and innovation and include access to:

- workplace documents
- case studies and, where possible, real situations
- office equipment and resources
- interaction with others.

Assessors must satisfy NVR/AQTF assessor requirements.

Links

Companion Volume implementation guides are found in VETNet - https://vetnet.gov.au/Pages/TrainingDocs.aspx?q=11ef6853-ceed-4ba7-9d87-4da407e23c10

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BSBINN502 Build and sustain an innovative work environment

Modification History

Release	Comments
Release 1	This version first released with BSB Business Services Training Package Version 1.0.

Application

This unit describes the skills and knowledge required to create an environment that enables and supports the application of innovative practice focusing on a holistic approach to the integration of innovation across all areas of work practice.

It applies to individuals working in leadership or management roles in any industry or community context. The individual could be employed by the organisation, but may also be an external contractor, the leader of a cross organisation team or of a self-formed team of individuals. The work group could be permanent or temporary in nature.

No licensing, legislative or certification requirements apply to this unit at the time of publication.

Unit Sector

Creativity and Innovation – Innovation

Elements and Performance Criteria

ELEMENT	PERFORMANCE CRITERIA
Elements describe the essential outcomes.	*Performance criteria describe the performance needed to demonstrate achievement of the element.*
1 Lead innovation by example	1.1 Make innovation an integral part of leadership and management activities 1.2 Demonstrate positive reception of ideas from others and provide constructive advice 1.3 Establish and maintain relationships based on mutual respect and trust

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ELEMENT	PERFORMANCE CRITERIA
	1.4 Take considered risks to open up opportunities for innovation 1.5 Regularly evaluate own approaches for consistency with the wider organisational or project context
2 Establish work practices that support innovation	2.1 Consult on and establish working conditions that reflect and encourage innovative practice 2.2 Introduce and maintain workplace procedures that foster innovation and allow for rigorous evaluation of innovative ideas 2.3 Facilitate and participate in collaborative work arrangements to foster innovation 2.4 Build and lead teams to work in ways that maximise opportunities for innovation
3 Promote innovation	3.1 Acknowledge suggestions, improvements and innovations from all colleagues 3.2 Find appropriate ways of celebrating and promoting innovation 3.3 Promote and reinforce the value of innovation according to the vision and objectives of the organisation or project 3.4 Promote and support the evaluation of innovative ideas within the wider organisational or project context
4 Create a physical environment which supports innovation	4.1 Evaluate the impact of the physical environment in relation to innovation 4.2 Collaborate with colleagues about ideas for enhancing the physical work environment before taking action 4.3 Consider potential for supporting innovation when selecting physical resources and equipment 4.4 Design, fit-out and decorate workspaces to encourage creative mindsets, collaborative working and the development of positive workplace relationships
5 Provide learning opportunities	5.1 Pro-actively share relevant information, knowledge and skills with colleagues 5.2 Provide or encourage formal and informal learning opportunities to help develop the skills needed for innovation 5.3 Create opportunities in which individuals can learn from the experience of others

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Foundation Skills

This section describes language, literacy, numeracy and employment skills incorporated in the performance criteria that are required for competent performance.

Skill	Performance Criteria	Description
Reading	1.5, 2.2, 4.1, 5.1	• Interprets and evaluates information that may deal with complex ideas related to issues both within and outside a given workplace context
Writing	3.3, 3.4, 5.1	• Develops information for others using language to suit the context and audience
Oral Communication	1.2, 2.1, 2.3, 3.1, 3.3, 3.4, 5.1	• Presents ideas and concepts to a range of audiences using structure and language to suit the audience • Uses active listening and questioning to discuss and clarify information and to confirm understanding
Navigate the world of work	1.1, 1.5, 2.1, 2.2, 3.3, 5.1, 5.2	• Takes responsibility for implementing practices and procedures to achieve organisational objectives in innovation according to role requirements • Stays up to date with professional development options to provide relevant information to staff
Interact with others	1.2, 1.3, 2.3, 2.4, 3.1-3.4, 4.2, 5.1, 5.3	• Uses appropriate communication techniques to build rapport and foster strong relationships with co-workers in a range of work contexts • Uses inclusive and collaborative techniques to share, promote and convey complex information about new ideas and systems within the workplace
Get the work done	1.1, 1.4, 1.5, 2.1, 3.2, 3.3, 4.1, 4.3, 4.4, 5.2, 5.3	• Accepts responsibility for planning and implementing tasks and practices to achieve organisational goals, negotiating key aspects with others and taking into account current capabilities and needs • Develops new and innovative ideas through exploration, evaluation, analysis and critical thinking • Facilitates a climate where people feel comfortable suggesting and discussing improvements or new ideas • Uses problem solving processes to identify, assess and respond to challenges and risks around innovation

Unit Mapping Information

Code and title current version	Code and title previous version	Comments	Equivalence status

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Code and title current version	Code and title previous version	Comments	Equivalence status
BSBINN502 Build and sustain an innovative work environment	BSBINN502A Build and sustain an innovative work environment	Updated to meet Standards for Training Packages	Equivalent unit

Links

Companion Volume implementation guides are found in VETNet - https://vetnet.gov.au/Pages/TrainingDocs.aspx?q=11ef6853-ceed-4ba7-9d87-4da407e23c10

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Assessment Requirements for BSBINN502 Build and sustain an innovative work environment

Modification History

Release	Comments
Release 1	This version first released with BSB Business Services Training Package Version 1.0.

Performance Evidence

Evidence of the ability to maximise opportunities for innovation by:

- establishing procedures and practices that foster innovation including:
  - collaborative work arrangements
  - building team capacity to contribute to innovation
  - providing formal and informal learning opportunities
  - evaluating ideas
  - celebration and promotion of innovation
  - consultation
  - respectful communications and sharing of ideas and feedback
- reinforcing the value of innovation to the vision and objectives of the organisation,
- model ling behaviour including being receptive to ideas, giving constructive advice, evaluating own work, establishing and maintaining relationships based on mutual respect and trust, taking considered risks that provide opportunities for innovation
- evaluating how the physical environment can be enhanced to support innovation and collaboration and collaborating on ideas to make improvements including in the selection of physical resources and equipment, and the design, fit-out and decoration of the workspaces
- making changes to a workspace that will encourage innovation in at least one of
  - design
  - fit-out
  - decoration.

Note: If a specific volume or frequency is not stated, then evidence must be provided at least once.

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Knowledge Evidence

To complete the unit requirements safely and effectively, the individual must:

- explain the concepts and theories of innovation and how these link to innovation in practice
- explain the context for innovation in the workplace including core business values, overall objectives, broader environmental context and the need to ensure the value and benefit of innovative ideas and projects
- discuss the factors and tools that can motivate individuals to use creative thinking and apply innovative work practices
- research the legislative framework that impacts on operations in the relevant workplace context
- explain how different approaches to management and leadership can support or hinder innovation
- discuss typical challenges and barriers to innovation within teams and organisations and ways of overcoming these including rewarding and celebrating innovation, coaching and learning, modelling behaviour and managing the physical environment.
-

Assessment Conditions

Assessment must be conducted in a safe environment where evidence gathered demonstrates consistent performance of typical activities experienced in the creativity and innovation and include access to:

- workplace documents
- case studies and, where possible, real situations
- office equipment and resources
- interaction with others.

Assessors must satisfy NVR/AQTF assessor requirements.

Links

Companion Volume implementation guides are found in VETNet - https://vetnet.gov.au/Pages/TrainingDocs.aspx?q=11ef6853-ceed-4ba7-9d87-4da407e23c10

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BSBLDR402 Lead effective workplace relationships

Modification History

Release	Comments
Release 1	This version first released with BSB Business Services Training Package Version 1.0.

Application

This unit defines skills, knowledge and outcomes required to use leadership to promote team cohesion. It includes motivating, mentoring, coaching and developing the team and forming the bridge between the management of the organisation and team members.

This unit applies to team leaders, supervisors and new or emerging managers where leadership plays a role in developing and maintaining effective workplace relationships. It applies in any industry or community context.

At this level work will normally be carried out within routine and non-routine methods and procedures, which require planning and evaluation and leadership and guidance of others.

No licensing, legislative or certification requirements apply to this unit at the time of publication.

Unit Sector

Management and Leadership - Leadership

Elements and Performance Criteria

ELEMENT	PERFORMANCE CRITERIA
Elements describe the essential outcomes.	*Performance criteria describe the performance needed to demonstrate achievement of the element.*
1. Collect, analyse and communicate information and ideas	1.1 Collect relevant information from appropriate sources and analyse and share with the work team to improve work performance 1.2 Communicate ideas and information in a manner which is appropriate and sensitive to the cultural and social diversity of the

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ELEMENT	PERFORMANCE CRITERIA
	audience and any specific needs 1.3 Lead consultation processes to encourage employees to contribute to issues related to their work, and promptly relay feedback to the work team in regard to outcomes 1.4 Seek and value contributions from internal and external sources in developing and refining new ideas and approaches 1.5 Implement processes to ensure that issues raised are resolved promptly or referred to relevant personnel as required
2. Develop trust and confidence as leader	2.1 Treat all internal and external contacts with integrity, respect and empathy 2.2 Use the organisation's social, ethical and business standards to develop and maintain effective relationships 2.3 Gain and maintain the trust and confidence of colleagues, customers and suppliers through competent performance 2.4 Adjust interpersonal styles and methods to meet organisation's social and cultural environment 2.5 Lead and encourage other members of the work team to follow examples set according to organisation's policies and procedures
3. Develop and maintain networks and relationships	3.1 Use networks to identify and build relationships 3.2 Use networks and other work relationships to provide identifiable benefits for the team and organisation
4. Manage difficulties into positive outcomes	4.1 Identify and analyse difficulties and take action to rectify the situation within the requirements of the organisation and relevant legislation 4.2 Guide and support colleagues to resolve work difficulties 4.3 Regularly review and improve workplace outcomes in consultation with relevant personnel 4.4 Manage poor work performance within the organisation's processes 4.5 Manage conflict constructively within the organisation's processes

Foundation Skills

This section describes language, literacy, numeracy and employment skills incorporated in the performance criteria that are required for competent performance.

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Skill	Performance Criteria	Description
Reading	1.1	• Collects, analyses and evaluates textual information from a range of resources to inform improvement strategies
Oral Communication	1.2, 1.3, 2.4, 2.5, 4.2	• Selects or adjusts communication style to maintain effectiveness of interaction and build and maintain engagement consistent with organisational requirements
Navigate the world of work	2.2, 2.5, 4.1, 4.4, 4.5	• Recognises and follows legislative and organisational requirements relevant to own role
Interact with others	1.1-1.4, 2.1, 2.3, 2.5, 3.1, 3.2, 4.2, 4.5	• Selects and uses appropriate conventions and protocols when communicating with diverse stakeholders • Adapts personal communication style to build trust and positive working relationships and to show respect for the opinions, values and particular needs of others • Plays a lead role in situations requiring effective collaboration, demonstrating conflict resolution skills and ability to engage and motivate others
Get the work done	1.1, 1.5, 4.1, 4.3	• Plans and implements activities and processes to manage and review work performance • Systematically gathers and analyses all relevant information to formulate and evaluate possible solutions to difficulties

Unit Mapping Information

Code and title current version	Code and title previous version	Comments	Equivalence status
BSBLDR402 Lead effective workplace relationships	BSBWOR401A Establish effective workplace relationships	Updated to meet Standards for Training Packages Title change Minor edits to clarify intent of performance criteria	Equivalent unit

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Links

Companion Volume implementation guides are found in VETNet - https://vetnet.gov.au/Pages/TrainingDocs.aspx?q=11ef6853-ceed-4ba7-9d87-4da407e23c10

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Assessment Requirements for BSBLDR402 Lead effective workplace relationships

Modification History

Release	Comments
Release 1	This version first released with BSB Business Services Training Package Version 1.0.

Performance Evidence

Evidence of the ability to:

- access and analyse information to achieve planned outcomes
- apply techniques for resolving problems and conflicts and dealing with poor performance within organisational and legislative requirements
- review and improve workplace outcomes in consultation with relevant personnel
- adjust interpersonal style and communications to respond to cultural and social diversity
- apply relationship management and communication skills with a range of people that:
  - demonstrate integrity, respect, empathy and cultural sensitivity and promote trust
  - forge effective relationships with internal and/or external people and help to maintain these networks
  - encourage participation and foster contribution of and respect for ideas and feedback
  - provide support to colleagues to resolve difficulties.

Note: If a specific volume or frequency is not stated, then evidence must be provided at least once.

Knowledge Evidence

To complete the unit requirements safely and effectively, the individual must:

- give examples of how work relationships, and the cultural and social environment, can support or hinder achieving planned outcomes
- explain techniques for developing positive work relationships and building trust and confidence in a team including interpersonal styles, communications, consultation, cultural and social sensitivity, networking
- explain the impact of legislation and organisational policies on workplace relationships
- describe a range of methods and techniques for communicating information and ideas to a range of stakeholders
- outline problems solving methods

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- explain methods to resolve workplace conflict
- explain methods to manage poor work performance
- explain how to monitor, analyse and introduce ways to improve work relationships.

Assessment Conditions

Assessment must be conducted in a safe environment where evidence gathered demonstrates consistent performance of typical activities experienced in the management and leadership field of work and include access to:

- relevant legislation, regulations, standards and codes
- relevant workplace documentation and resources
- case studies and, where possible, real situations
- interaction with others.

Assessors must satisfy NVR/AQTF assessor requirements.

Links

Companion Volume implementation guides are found in VETNet - https://vetnet.gov.au/Pages/TrainingDocs.aspx?q=11ef6853-ceed-4ba7-9d87-4da407e23c10

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BSBLDR403 Lead team effectiveness

Modification History

Release	Comments
Release 1	This version first released with BSB Business Services Training Package Version 1.0.

Application

This unit defines skills, knowledge and outcomes required to plan and supervise the performance of the team and develop team cohesion.

It applies team leaders, supervisors and new emerging managers who have an important leadership role in the development of efficient and effective work teams.

Leaders at this level also provide leadership for the team and bridge the gap between the management of the organisation and the team members. As such they must 'manage up' as well as manage their team/s.

No licensing, legislative or certification requirements apply to this unit at the time of publication.

Unit Sector

Management and Leadership - Leadership

Elements and Performance Criteria

ELEMENT	PERFORMANCE CRITERIA
Elements describe the essential outcomes.	*Performance criteria describe the performance needed to demonstrate achievement of the element.*
1. Plan to achieve team outcomes	1.1 Lead the team to identify, establish and document team purpose, roles, responsibilities, goals, plans and objectives in consultation with team members 1.2 Engage team members to incorporate innovation and

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ELEMENT	PERFORMANCE CRITERIA
	productivity measures in work plans 1.3 Lead and support team members in meeting expected outcomes
2. Lead team to develop cohesion	2.1 Provide opportunities for input of team members into planning, decision making and operational aspects of work team 2.2 Encourage and support team members to take responsibility for own work and to assist each other in undertaking required roles and responsibilities 2.3 Provide feedback to team members to encourage, value and reward individual and team efforts and contributions 2.4 Recognise and address issues, concerns and problems identified by team members or refer to relevant persons as required 2.5 Model expected behaviours and approaches
3. Participate in and facilitate work team	3.1 Actively encourage team members to participate in and take responsibility for team activities and communication processes 3.2 Give the team support to identify and resolve problems which impede its performance 3.3 Ensure own contribution to work team serves as a role model for others and enhances the organisation's image within the work team, the organisation and with clients/customers
4. Liaise with management	4.1 Maintain open communication with line manager/management at all times 4.2 Communicate information from line manager/management to the team 4.3 Communicate unresolved issues, concerns and problems raised by the team/team members to line manager/management and ensure follow-up action is taken 4.4 Communicate unresolved issues, concerns and problems related to the team/team members raised by line managers/management to the team and ensure follow-up to action is taken

Foundation Skills

This section describes language, literacy, numeracy and employment skills incorporated in the performance criteria that are required for competent performance.

Skill	Performance	Description

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	Criteria	
Writing	1.1, 4.2	• Prepares workplace plans that communicate intent and elicits feedback clearly and effectively
Oral communication	1.1, 1.3, 2.2, 2.3, 3.1, 3.2, 4.2-4.4	• Engages in discussions or provides information using structure and language appropriate to the audience and situation
Interact with others	1.1-1.3, 2.1-2.5, 3.1, 3.3, 4.1	• Selects and uses appropriate conventions and protocols when communicating with team members • Adapts personal communication style to model required behaviours, build trust and positive working relationships and to show respect for the opinions and values of others • Plays a lead role in situations requiring effective collaboration, demonstrating conflict resolution skills and ability to engage and motivate others
Get the work done	1.1-1.3, 3.2	• Develops, implements and monitors plans and processes to ensure team engagement and effectiveness • Uses formal analytical thinking techniques to identify issues and generate possible solutions, seeking input from others as required

Unit Mapping Information

Code and title current version	**Code and title previous version**	**Comments**	**Equivalence status**
BSBLDR403 Lead team effectiveness	BSBWOR402A Promote team effectiveness	Updated to meet Standards for Training Packages Title change Minor edits to clarify intent of performance criteria	Equivalent unit

Links

Companion Volume implementation guides are found in VETNet - https://vetnet.gov.au/Pages/TrainingDocs.aspx?q=11ef6853-ceed-4ba7-9d87-4da407e23c10

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Assessment Requirements for BSBLDR403 Lead team effectiveness

Modification History

Release	Comments
Release 1	This version first released with BSB Business Services Training Package Version 1.0.

Performance Evidence

Evidence of the ability to:

- apply knowledge of organisational goals, objectives and plans
- develop a team work plan including documentation of how it was generated and how it will be monitored
- identify and incorporate innovation and productivity measures into a team work plan
- communicate with team members and management to identify and establish the team purpose, roles, responsibilities, goals plans and objectives and resolve problems
- use techniques to consult, encourage, support and provide feedback to team members
- model team leadership behaviours and approaches
- liaise with management to develop the teamwork plan, resolve issues and ensure follow-up action is taken.

Note: If a specific volume or frequency is not stated, then evidence must be provided at least once.

Knowledge Evidence

To complete the unit requirements safely and effectively, the individual must explain principles and techniques associated with:

- delegation and work allocation
- goal setting
- group dynamics and processes
- individual behaviour and difference
- leadership styles
- motivation
- negotiation
- problem solving
- planning

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- workplace innovation
- workplace productivity.

Assessment Conditions

Assessment must be conducted in a safe environment where evidence gathered demonstrates consistent performance of typical activities experienced in the management and leadership field of work and include access to:

- information about the organisation, including organisational structure, goals, objectives and plans
- case studies, and where possible, real situations
- workplace equipment and resources
- interaction with others.

Assessors must satisfy NVR/AQTF assessor requirements.

Links

Companion Volume implementation guides are found in VETNet - https://vetnet.gov.au/Pages/TrainingDocs.aspx?q=11ef6853-ceed-4ba7-9d87-4da407e23c10

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BSBLED401 Develop teams and individuals

Modification History

Release	Comments
Release 2	This version released with BSB Business Services Training Package Version 2.0. Version created to clarify assessment requirements
Release 1	This version first released with BSB Business Services Training Package Version 1.0.

Application

This unit describes the skills and knowledge required to determine individual and team development needs and to facilitate the development of the workgroup.

It applies to individuals with a broad knowledge of learning and development who apply their skills in addressing development needs to meet team objectives. They may have responsibility to provide guidance or to delegate aspects of tasks to others.

No licensing, legislative or certification requirements apply to this unit at the time of publication.

Unit Sector

Workforce Development – Learning and Development

Elements and Performance Criteria

ELEMENT	PERFORMANCE CRITERIA
Elements describe the essential outcomes.	*Performance criteria describe the performance needed to demonstrate achievement of the element.*
1. Determine development needs	1.1 Systematically identify and implement learning and development needs in line with organisational requirements 1.2 Ensure that a learning plan to meet individual and group training and development needs is collaboratively developed, agreed to and

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ELEMENT	PERFORMANCE CRITERIA
	implemented 1.3 Encourage individuals to self-evaluate performance and identify areas for improvement 1.4 Collect feedback on performance of team members from relevant sources and compare with established team learning needs
2. Develop individuals and teams	2.1 Identify learning and development program goals and objectives, ensuring a match to the specific knowledge and skill requirements of competency standards relevant to the industry 2.2 Ensure that learning delivery methods are appropriate to the learning goals, the learning style of participants, and availability of equipment and resources 2.3 Provide workplace learning opportunities, and coaching and mentoring assistance to facilitate individual and team achievement of competencies 2.4 Create development opportunities that incorporate a range of activities and support materials appropriate to the achievement of identified competencies 2.5 Identify and approve resources and time lines required for learning activities in accordance with organisational requirements
3. Monitor and evaluate workplace learning	3.1 Use feedback from individuals or teams to identify and implement improvements in future learning arrangements 3.2 Assess and record outcomes and performance of individuals/teams to determine the effectiveness of development programs and the extent of additional development support 3.3 Negotiate modifications to learning plans to improve the efficiency and effectiveness of learning 3.4 Document and maintain records and reports of competency according to organisational requirements

Foundation Skills

This section describes language, literacy, numeracy and employment skills incorporated in the performance criteria that are required for competent performance.

Skill	Performance Criteria	Description

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Learning	1.1-1.4, 2.1-2.4, 3.1, 3.3	• Uses structured approaches to set goals, monitor progress and adjust learning approaches for self and others • Builds on knowledge and experience to facilitate interaction and learning with others
Reading	1.1, 1.2, 1.4, 2.1, 2.2, 2.4, 2.5, 3.1-3.4	• Analyses textual information from a range of sources to identify organisational requirements • Analyses information from a range of sources to evaluate performance
Writing	1.1, 1.2, 1.4, 2.1, 2.5, 3.1-3.4	• Develops materials to suit the requirements of different roles and individuals in the organisation • Maintains records using correct technical and organisational vocabulary
Oral Communication	1.2, 1.3, 1.4, 2.3, 3.1, 3.3	• Uses vocabulary appropriate to context and to establish a supportive and learning environment • Uses listening and questioning techniques to confirm or show understanding of different perspectives
Navigate the world of work	1.1, 2.5, 3.4	• Recognises and responds to explicit and implicit organisational procedures and protocols Understands how own role meshes with others and contributes to broader goals
Interact with others	1.2, 1.3, 1.4, 2.2, 2.3, 3.1, 3.3	• Selects and uses appropriate conventions and protocols when communicating with co-workers in a range of work contexts • Recognises the importance of building rapport to establish effective working relationships • Collaborates with others to achieve joint outcomes, playing an active role in facilitating effective group interaction • Negotiates with others to achieve joint/agreeable outcomes playing an active role in facilitating consensus in potentially contentious situations
Get the work done	1.1, 1.2, 1.4, 2.1, 2.2, 2.3, 2.5, 3.1, 3.2, 3.4	• Uses logical planning processes to organise, implement and monitor learning and development needs • Systematically gathers and analyses all relevant information and evaluates options to make informed decisions • Evaluates outcomes of decisions to identify opportunities for improvement

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Unit Mapping Information

Code and title current version	Code and title previous version	Comments	Equivalence status
BSBLED401 Develop teams and individuals Release 2	BSBLED401 Develop teams and individuals Release 1	Updated to clarify assessment requirements	Equivalent unit

Links

Companion Volume implementation guides are found in VETNet - https://vetnet.gov.au/Pages/TrainingDocs.aspx?q=11ef6853-ceed-4ba7-9d87-4da407e23c10

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Assessment Requirements for BSBLED401 Develop teams and individuals

Modification History

Release	Comments
Release 2	This version released with BSB Business Services Training Package Version 2.0. Version created to clarify assessment requirements
Release 1	This version first released with BSB Business Services Training Package Version 1.0.

Performance Evidence

Evidence of the ability to:

- systematically identify and implement learning opportunities for others
- collect feedback on team and individual performance
- give and receive feedback from team members to encourage participation in and effectiveness of the team
- collaboratively develop learning plans to match skill needs of individuals and groups
- provide mentoring and coaching assistance to teams and individuals
- monitor and review workplace learning.

Note: If a specific volume or frequency is not stated, then evidence must be provided at least once.

Knowledge Evidence

To complete the unit requirements safely and effectively, the individual must:

- describe facilitation techniques to encourage team development and improvement
- outline organisational policies, plans and procedures for developing teams
- identify career paths and competency standards relevant to the industry.

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Assessment Conditions

Assessment must be conducted in a safe environment where evidence gathered demonstrates consistent performance of typical activities experienced in the workforce learning and development field of work and include access to:

- office equipment and resources
- learning and development plans, policies and procedures
- case studies and, where available, real situations
- interaction with others.

Assessors of this unit must satisfy the requirements for assessors in applicable vocational education and training legislation, frameworks and/or standards.

Links

Companion Volume implementation guides are found in VETNet - https://vetnet.gov.au/Pages/TrainingDocs.aspx?q=11ef6853-ceed-4ba7-9d87-4da407e23c10

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BSBLED501 Develop a workplace learning environment

Modification History

Release	Comments
Release 1	This version first released with BSB Business Services Training Package Version 1.0.

Application

This unit describes the skills and knowledge required to encourage and support the development of a learning environment in which work and learning come together. Particular emphasis is on the development of strategies to facilitate and promote learning and to monitor and improve learning performance.

It applies to individuals who have a prominent role in encouraging, supporting and facilitating the development of a learning environment in which work and learning come together.

At this level work will normally be carried out within complex and diverse methods and procedures, which require the exercise of considerable discretion and judgement, using a range of problem solving and decision making strategies.

No licensing, legislative or certification requirements apply to this unit at the time of publication.

Unit Sector

Workforce Development – Learning and Development

Elements and Performance Criteria

ELEMENT	PERFORMANCE CRITERIA
Elements describe the essential outcomes.	*Performance criteria describe the performance needed to demonstrate achievement of the element.*
1. Create learning opportunities	1.1 Identify potential formal and informal learning opportunities 1.2 Identify learning needs of individuals in relation to the needs of

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ELEMENT	PERFORMANCE CRITERIA
	the team and/or enterprise and available learning opportunities 1.3 Develop and implement learning plans as an integral part of individual and team performance plans 1.4 Develop strategies to ensure that learning plans reflect the diversity of needs 1.5 Ensure organisational procedures maximise individual and team access to, and participation in, learning opportunities 1.6 Ensure effective liaison occurs with training and development specialists and contributes to learning opportunities which enhance individual, team and organisational performance
2. Facilitate and promote learning	2.1 Develop strategies to ensure that workplace learning opportunities are used and that team members are encouraged to share their skills and knowledge to encourage a learning culture within the team 2.2 Implement organisational procedures to ensure workplace learning opportunities contribute to the development of appropriate workplace knowledge, skills and attitudes 2.3 Implement policies and procedures to encourage team members to assess their own competencies and to identify their own learning and development needs 2.4 Share the benefits of learning with others in the team and organisation 2.5 Recognise workplace achievement by timely and appropriate recognition, feedback and rewards
3. Monitor and improve learning effectiveness	3.1 Use strategies to ensure that team and individual learning performance is monitored to determine the type and extent of any additional work-based support required and any Work Health and Safety (WHS) issues 3.2 Use feedback from individuals and teams to identify and introduce improvements in future learning arrangements 3.3 Make adjustments, negotiated with training and development specialists, for improvements to the efficiency and effectiveness of learning 3.4 Use processes to ensure that records and reports of competency are documented and maintained within the organisation’s systems and procedures to inform future planning

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Foundation Skills

This section describes language, literacy, numeracy and employment skills incorporated in the performance criteria that are required for competent performance.

Skill	Performance Criteria	Description
Learning	1.1, 1.2, 1.3, 1.4, 2.1, 2.4, 3.1, 3.2	• Develops strategies to develop learning plans of self and others to meet a diversity of needs within organisational constraints • Transfers skills and knowledge to a variety of learning development contexts
Reading	1.1-1.5, 2.1, 2.2, 2.5, 3.1-3.4	• Interprets textual information obtained from a range of sources and determines how content may be applied to individuals and to organisational requirements
Writing	1.3, 1.4, 2.1, 2.2, 2.3, 2.5, 3.3, 3.4	• Uses information from a range of sources to develop and document plans, strategies and feedback in accordance with organisational requirements • Maintains records using correct technical and organisational vocabulary
Oral Communication	1.6, 2.4, 2.5, 3.2, 3.3	• Present information and opinions using language and features appropriate to the audience and context • Uses questioning and listening techniques to identify learning needs and obtain feedback
Navigate the world of work	1.5, 2.2, 2.3, 3.1, 3.4	• Recognises and responds to both explicit and implicit organisational procedures and protocols and legislative/regulatory requirements • Understands how own role meshes with others and contributes to broader goals
Interact with others	1.6, 2.1, 2.3 -2.5, 3.2, 3.3	• Selects the appropriate form, channel and mode of communication for a specific purpose relevant to own role • Collaborates with others to achieve joint outcomes, playing an active role in facilitating effective group interaction, influencing direction and taking a leadership role on occasion • Recognises the importance of building rapport to establish effective working relationships • Applies a range of communication strategies to encourage others to share their knowledge and skills and reflect on the effectiveness of the interaction
Get the work done	1.1, 1.2, 1.3, 1.4, 2.1, 2.5, 3.1, 3.4	• Uses logical processes to plan, implement and monitor learning in the workplace • Systematically gathers and analyses relevant

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		information and evaluates options to make informed decisions • Evaluates outcomes of decisions to identify opportunities for improvement • Uses digital tools to organise, store, integrate and share relevant information

Unit Mapping Information

Code and title current version	**Code and title previous version**	**Comments**	**Equivalence status**
BSBLED501 Develop a workplace learning environment	BSBLED501A Develop a workplace learning environment	Updated to meet Standards for Training Packages	Equivalent unit

Links

Companion Volume implementation guides are found in VETNet - https://vetnet.gov.au/Pages/TrainingDocs.aspx?q=11ef6853-ceed-4ba7-9d87-4da407e23c10

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Assessment Requirements for BSBLED501 Develop a workplace learning environment

Modification History

Release	Comments
Release 1	This version first released with BSB Business Services Training Package Version 1.0

Performance Evidence

Evidence of the ability to:

- collaboratively review performance development needs of individuals and teams
- plan professional development for individuals and teams that enhances organisational performance
- develop and implement learning plans
- liaise with training and development specialists
- recognise workplace achievement by giving feedback, recognition and rewards
- monitor and improve workplace learning
- record and report workplace learning outcomes.

Note: If a specific volume or frequency is not stated, then evidence must be provided at least once.

Knowledge Evidence

To complete the unit requirements safely and effectively, the individual must:

- explain how management of relationships can achieve a learning environment
- identify principles and techniques involved in the management and organisation of:
  - adult learning
  - coaching and mentoring
  - consultation and communication
  - improvement strategies
  - leadership
  - learning environment and learning culture
  - monitoring and reviewing workplace learning
  - problem identification and resolution
  - record keeping and management methods

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- structured learning
- work-based learning.

Assessment Conditions

Assessment must be conducted in a safe environment where evidence gathered demonstrates consistent performance of typical activities experienced in the workforce learning and development field of work and include access to:

- workplace policies and procedures
- workplace equipment and resources
- case studies and, where available, real situations
- interaction with others.

Assessors must satisfy NVR/AQTF assessor requirements.

Links

Companion Volume implementation guides are found in VETNet - https://vetnet.gov.au/Pages/TrainingDocs.aspx?q=11ef6853-ceed-4ba7-9d87-4da407e23c10

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BSBMGT402 Implement operational plan

Modification History

Release	Comments
Release 1	This version first released with BSB Business Services Training Package Version 1.0.

Application

This unit describes the skills and knowledge required to implement the operational plan by monitoring and adjusting operational performance, planning and acquiring resources and providing reports on performance as required.

It applies to individuals who plan activities to achieve the measurable, stated objectives of the team and the organisation. At this level work will normally be carried out within routine and non-routine methods and procedures which require planning, evaluation, leadership and guidance of others.

No licensing, legislative or certification requirements apply to this unit at the time of publication.

Unit Sector

Management and Leadership – Management

Elements and Performance Criteria

ELEMENT	PERFORMANCE CRITERIA
Elements describe the essential outcomes.	*Performance criteria describe the performance needed to demonstrate achievement of the element.*
1. Implement operational plan	1.1 Collate, analyse and organise details of resource requirements in consultation with relevant personnel, colleagues and specialist resource managers 1.2 Implement operational plans to contribute to the achievement of organisation's performance/business plan 1.3 Identify and use key performance indicators (KPIs) to monitor

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ELEMENT	PERFORMANCE CRITERIA
	operational performance 1.4 Manage contingencies by adjusting the implementation of the operational plan in consultation with others 1.5 Provide assistance in the development and presentation of proposals for resource requirements in line with operational planning processes
2. Implement resource acquisition	2.1 Recruit and induct employees within organisation's policies, practices and procedures 2.2 Implement plans for acquisition of physical resources and services within organisation's policies, practices and procedures and in consultation with relevant personnel
3. Monitor operational performance	3.1 Monitor performance systems and processes to assess progress in achieving profit/productivity plans and targets 3.2 Analyse and use budget and actual financial information to monitor profit/productivity performance 3.3 Identify unsatisfactory performance and take prompt action to rectify the situation according to organisational policies 3.4 Provide mentoring, coaching and supervision to support individuals and teams to use resources effectively, economically and safely 3.5 Present recommendations for variation to operational plans to the designated persons/groups and gain approval 3.6 Implement systems, procedures and records associated with performance in accordance with organisation's requirements

Foundation Skills

This section describes language, literacy, numeracy and employment skills incorporated in the performance criteria that are required for competent performance.

Skill	Performance Criteria	Description
Learning	3.4	• Actively reinforces learning by applying new knowledge and skills in mentoring, coaching and supervising others
Reading	1.1-1.5, 2.1, 2.2, 3.1, 3.2, 3.6	• Identifies, interprets, analyses and reviews textual information related to the operational plan and

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		monitoring of operational performance
Writing	1.1-1.5, 2.1, 2.2, 3.2-3.6	• Communicates relationships between ideas and information, matching style of writing to purpose and audience • Researches, plans and prepares workplace documentation for relevant stakeholders using organisational formats
Oral Communication	1.1, 1.4, 1.5, 2.1, 2.2, 3.3, 3.4, 3.5	• Participates in a variety of spoken exchanges with a range of audiences varying structure and language to suit the audience
Numeracy	1.1, 1.2, 1.3, 1.4, 1.5, 2.2, 3.1, 3.2, 3.3	• Selects and uses familiar mathematical techniques to organise timely supply of adequate resources for the operational plan and to use budgetary information to monitor performance
Navigate the world of work	1.5, 2.1, 2.2, 3.3, 3.4, 3.6	• Monitors adherence to organisational policies and procedures and considers own role in terms of its contribution to broader goals of the work environment
Interact with others	1.1, 1.4, 1.5, 2.1, 2.2, 3.3, 3.4, 3.5	• Selects and uses appropriate conventions and protocols when communicating with diverse individuals to build rapport, seek or present information • Collaborates with others to achieve joint outcomes, playing an active role in facilitating effective group communication, influencing direction and taking a leadership role on occasion
Get the work done	1.1, 1.2, 1.3, 1.4, 1.5, 2.2, 3.1, 3.2, 3.3, 3.6	• Takes responsibility for planning, organising, implementing and monitoring tasks required to achieve required outcomes • Uses systematic, analytical processes in complex, non-routine situations, setting goals, gathering relevant information and identifying and evaluating options against agreed criteria • Evaluates effectiveness of decisions in terms of how well they met stated goals • Recognises and addresses an increasing range of familiar problems by implementing contingency plans

Unit Mapping Information

Code and title current version	**Code and title previous version**	**Comments**	**Equivalence status**
BSBMGT402 Implement	BSBMGT402A Implement	Updated to meet Standards for	Equivalent unit

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Code and title current version	Code and title previous version	Comments	Equivalence status
operational plan	operational plan	Training Packages. Edits to clarify intent of Performance Criteria.	

Links

Companion Volume implementation guides are found in VETNet - https://vetnet.gov.au/Pages/TrainingDocs.aspx?q=11ef6853-ceed-4ba7-9d87-4da407e23c10

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Assessment Requirements for BSBMGT402 Implement operational plan

Modification History

Release	Comments
Release 1	This version first released with BSB Business Services Training Package Version 1.0.

Performance Evidence

Evidence of the ability to:

- interact with a range of people/groups to identify resource requirements, performance objectives, systems, procedures and records relating to the operational plan
- vary the operational plan and gain approval to deal with contingencies
- monitor operational performance against the performance objectives and budgets and take action to rectify unsatisfactory performance
- plan and acquire physical and human resources using organisation's systems and procedures
- manage and support personnel to achieve performance objectives. including inducting new employees and providing mentoring and coaching
- present information and recommendations to support implementation and variation of the operational plan
- document and provide reports on performance as required by the organisation.

Note: If a specific volume or frequency is not stated, then evidence must be provided at least once.

Knowledge Evidence

To complete the unit requirements safely and effectively, the individual must:

- describe performance monitoring systems and processes
- describe methods for problem solving
- explain how organisational policies and procedures relate to the operational plan.

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Assessment Conditions

Assessment must be conducted in a safe environment where evidence gathered demonstrates consistent performance of typical activities experienced in the management and leadership field of work and include access to:

- organisational operational plans, policies and procedures
- workplace documentation and resources including budgets, physical and human resource procurement documentation, employee induction and performance monitoring procedures
- case studies and, where possible, real situations.

Assessors must satisfy NVR/AQTF assessor requirements.

Links

Companion Volume implementation guides are found in VETNet - https://vetnet.gov.au/Pages/TrainingDocs.aspx?q=11ef6853-ceed-4ba7-9d87-4da407e23c10

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BSBMGT403 Implement continuous improvement

Modification History

Release	Comments
Release 1	This version first released with BSB Business Services Training Package Version 1.0.

Application

This unit describes the skills and knowledge required to implement the organisation's continuous improvement systems and processes. It covers using systems and strategies to actively encourage the team to participate in the process, monitoring and reviewing performance, and identifying opportunities for further improvements.

It applies to managers who have an active role in implementing the continuous improvement process to achieve the organisation's objectives. Their position is closely associated with the creation and delivery of products and services which means that they have an important role in influencing the ongoing development of the organisation.

At this level, work will normally be carried out within routine and non-routine methods and procedures, which require planning, evaluation, leadership and guidance of others.

No licensing, legislative or certification requirements apply to this unit at the time of publication.

Unit Sector

Management and Leadership – Management

Elements and Performance Criteria

ELEMENT	PERFORMANCE CRITERIA
Elements describe the essential outcomes.	*Performance criteria describe the performance needed to demonstrate achievement of the element.*
1. Implement continuous improvement systems and	1.1 Implement systems to ensure that individuals and teams are actively encouraged and supported to participate in decision

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ELEMENT	PERFORMANCE CRITERIA
processes	making processes, assume responsibility and exercise initiative 1.2 Communicate the organisation's continuous improvement processes to individuals and teams, and obtain feedback 1.3 Ensure effective mentoring and coaching allows individuals and teams to implement the organisation's continuous improvement processes
2. Monitor and review performance	2.1 Use the organisation's systems and technology to monitor and review progress and to identify ways in which planning and operations could be improved 2.2 Improve customer service through continuous improvement techniques and processes 2.3 Formulate and communicate recommendations for adjustments to those who have a role in their development and implementation
3. Provide opportunities for further improvement	3.1 Implement processes to ensure that team members are informed of savings and productivity/service improvements in achieving the business plan 3.2 Document work performance to aid the identification of further opportunities for improvement 3.3 Manage records, reports and recommendations for improvement within the organisation's systems and processes

Foundation Skills

This section describes language, literacy, numeracy and employment skills incorporated in the performance criteria that are required for competent performance.

Skill	Performance Criteria	Description
Reading	1.1, 1.2, 2.1, 3.2, 3.3	• Evaluates and integrates facts and ideas to construct meaning from a range of text types in an effort to implement continuous improvement systems and processes
Writing	1.1, 1.2, 2.1, 2.2, 2.3, 3.1, 3.2, 3.3	• Selects vocabulary, grammatical structures and conventions appropriate to text • Researches, plans and prepares continuous improvement documentation for relevant stakeholders
Oral	1.2, 1.3, 2.3	• Participates in a variety of spoken exchanges with a range of audiences using structure and language to suit

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Communication		the audience
Navigate the world of work	2.1	• Monitors adherence to organisational policies and procedures and considers own role in terms of its contribution to broader goals of the work environment
Interact the work of others	1.2, 1.3, 2.3, 3.1	• Selects and uses appropriate conventions and protocols when communicating with diverse individuals to seek or share information • Collaborates with others to achieve joint outcomes, playing an active role in facilitating effective group communication, influencing direction and taking a leadership role on occasion
Get the work done	1.1, 1.3, 2.1, 2.2, 3.1, 3.2, 3.3	• Takes responsibility for planning and organising own workload to achieve required outcomes • Uses systematic, analytical processes in complex, non-routine situations, setting goals, gathering relevant information and identifying and evaluating options against agreed criteria • Evaluates effectiveness of decisions in terms of how well they meet stated goals • Uses digital applications to access and filter data, extract, organise, integrate and share relevant information • Recognises the potential of new approaches to enhance work practices and outcomes

Unit Mapping Information

Code and title current version	**Code and title previous version**	**Comments**	**Equivalence status**
BSBMGT403 Implement continuous improvement	BSBMGT403A Implement continuous improvement	Updated to meet Standards for Training Packages	Equivalent unit

Links

Companion Volume implementation guides are found in VETNet - https://vetnet.gov.au/Pages/TrainingDocs.aspx?q=11ef6853-ceed-4ba7-9d87-4da407e23c10

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Assessment Requirements for BSBMGT403 Implement continuous improvement

Modification History

Release	Comments
Release 1	This version first released with BSB Business Services Training Package Version 1.0.

Performance Evidence

Evidence of the ability to:

- implement continuous improvement systems and provide mentoring and coaching support to enable individuals and teams to participate in decisions, take responsibility, show initiative and implement improvement processes
- implement processes to inform team members about savings and productivity/service improvements achievements
- communicate effectively to support the continuous improvement system and implementation of improvements
- apply continuous improvement to customer services including internal and external customers
- implement, monitor and adjust improvement plans, processes and procedures to improve performance
- document performance to identify further opportunities for improvement
- manage records and reports within the organisation's systems and procedures.

Note: If a specific volume or frequency is not stated, then evidence must be provided at least once.

Knowledge Evidence

To complete the unit requirements safely and effectively, the individual must:

- give examples of continuous improvement processes
- list typical areas of need for coaching and mentoring to support continuous improvement
- explain how change management techniques can support continuous improvement and initiative
- identify the organisation's systems and data that can be used for benchmarking and monitoring performance for continuous improvement.

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Assessment Conditions

Assessment must be conducted in a safe environment where evidence gathered demonstrates consistent performance of typical activities experienced in the management and leadership field of work and include access to:

- relevant workplace documentation and resources
- case studies and, where possible, real situations
- interaction with others.

Assessors must satisfy NVR/AQTF assessor requirements.

Links

Companion Volume implementation guides are found in VETNet - https://vetnet.gov.au/Pages/TrainingDocs.aspx?q=11ef6853-ceed-4ba7-9d87-4da407e23c10

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BSBMGT502 Manage people performance

Modification History

Release	Comments
Release 1	This version first released with BSB Business Services Training Package Version 1.0.

Application

This unit describes the skills and knowledge required to manage the performance of staff who report to them directly. Development of key result areas and key performance indicators and standards, coupled with regular and timely coaching and feedback, provide the basis for performance management.

It applies to individuals who manage people. It covers work allocation and the methods to review performance, reward excellence and provide feedback where there is a need for improvement.

The unit makes the link between performance management and performance development, and reinforces both functions as a key requirement for effective managers.

No licensing, legislative or certification requirements apply to this unit at the time of publication.

Unit Sector

Management and Leadership – Management

Elements and Performance Criteria

ELEMENT	PERFORMANCE CRITERIA
Elements describe the essential outcomes.	*Performance criteria describe the performance needed to demonstrate achievement of the element.*
1. Allocate work	1.1 Consult relevant groups and individuals on work to be allocated and resources available

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ELEMENT	PERFORMANCE CRITERIA
	1.2 Develop work plans in accordance with operational plans 1.3 Allocate work in a way that is efficient, cost effective and outcome focussed 1.4 Confirm performance standards, Code of Conduct and work outputs with relevant teams and individuals 1.5 Develop and agree performance indicators with relevant staff prior to commencement of work 1.6 Conduct risk analysis in accordance with the organisational risk management plan and legal requirements
2. Assess performance	2.1 Design performance management and review processes to ensure consistency with organisational objectives and policies 2.2 Train participants in the performance management and review process 2.3 Conduct performance management in accordance with organisational protocols and time lines 2.4 Monitor and evaluate performance on a continuous basis
3. Provide feedback	3.1 Provide informal feedback to staff on a regular basis 3.2 Advise relevant people where there is poor performance and take necessary actions 3.3 Provide on-the-job coaching when necessary to improve performance and to confirm excellence in performance 3.4 Document performance in accordance with the organisational performance management system 3.5 Conduct formal structured feedback sessions as necessary and in accordance with organisational policy
4. Manage follow up	4.1 Write and agree on performance improvement and development plans in accordance with organisational policies 4.2 Seek assistance from human resources specialists, where appropriate 4.3 Reinforce excellence in performance through recognition and continuous feedback 4.4 Monitor and coach individuals with poor performance 4.5 Provide support services where necessary 4.6 Counsel individuals who continue to perform below expectations and implement the disciplinary process if necessary 4.7 Terminate staff in accordance with legal and organisational

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ELEMENT	PERFORMANCE CRITERIA
	requirements where serious misconduct occurs or ongoing poor-performance continues

Foundation Skills

This section describes language, literacy, numeracy and employment skills incorporated in the performance criteria that are required for competent performance.

Skill	Performance Criteria	Description
Learning	2.2, 3.3, 4.4	• Consolidates and improves own knowledge and skills by coaching, mentoring or training others
Reading	1.2, 1.6, 2.4	• Gathers, interprets and analyses texts in organisational documents to facilitate performance management
Writing	1.2, 1.4, 1.5, 1.6, 2.1, 2.3, 2.4, 3.4, 3.5, 4.1, 4.7	• Plans and prepares documents for allocating work and managing performance suitable for the target audience and in accordance with organisational requirements
Oral Communication	1.1, 1.4, 1.5, 2.2, 2.3, 3.1, 3.2, 3.3, 3.5, 4.2-4.7	• Uses language and structure appropriate to context and audience to explain expected standards of performance, provide feedback and coach staff
Numeracy	1.3, 1.4, 1.5, 1.6, 2.1, 2.4, 3.4, 4.1	• Extracts and evaluates mathematical information embedded in a range of tasks and text relating to performance standards and risk analysis
Navigate the world of work	1.2, 1.6, 2.1, 2.3, 3.4, 3.5, 4.1, 4.7	• Appreciates the implications of legal and regulatory responsibilities related to own work and the organisation as a whole • Monitors adherence to organisational policies and procedures
Interact with others	1.1, 1.3, 1.4, 1.5, 2.2, 3.1, 3.2, 3.3, 4.2-4.6	• Recognises and applies the protocols governing what to communicate to whom and how in a range of work contexts • Collaborates with others to achieve joint outcomes, influencing direction and taking a leadership role on occasion
Get the work done	1.2, 1.3, 1.5, 1.6, 2.1, 2.4, 4.1, 4.2	• Sequences and schedules complex activities, monitors implementation and manages relevant communication • Seeks advice, feedback and support as required to assist in the decision-making process • Uses experiences to reflect on the ways in which

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		variables impact on performance

Unit Mapping Information

Code and title current version	**Code and title previous version**	**Comments**	**Equivalence status**
BSBMGT502 Manage people performance	BSBMGT502B Manage people performance	Updated to meet Standards for Training Packages	Equivalent unit

Links

Companion Volume implementation guides are found in VETNet - https://vetnet.gov.au/Pages/TrainingDocs.aspx?q=11ef6853-ceed-4ba7-9d87-4da407e23c10

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Assessment Requirements for BSBMGT502 Manage people performance

Modification History

Release	Comments
Release 1	This version first released with BSB Business Services Training Package Version 1.0.

Performance Evidence

Evidence of the ability to:

- consult with relevant stakeholders to identify work requirements, performance standards and agreed performance indicators
- develop work plans and allocate work to achieve outcomes efficiently and within organisational and legal requirements
- monitor, evaluate and provide feedback on performance and provide coaching or training, as needed
- reinforce excellence in performance through recognition and continuous feedback
- seek assistance from human resources specialists where appropriate
- keep records and documentation in accordance with the organisational performance management system.

Note: If a specific volume or frequency is not stated, then evidence must be provided at least once.

Knowledge Evidence

To complete the unit requirements safely and effectively, the individual must:

- outline relevant legislative and regulatory requirements
- outline relevant awards and certified agreements
- explain performance measurement systems utilised within the organisation
- explain unlawful dismissal rules and due process
- describe staff development options and information.

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Assessment Conditions

Assessment must be conducted in a safe environment where evidence gathered demonstrates consistent performance of typical activities experienced in the management and leadership field of work and include access to:

- relevant legislation
- workplace documentation and resources
- case studies and, where possible, real situations
- interaction with others.

Assessors must satisfy NVR/AQTF assessor requirements.

Links

Companion Volume implementation guides are found in VETNet - https://vetnet.gov.au/Pages/TrainingDocs.aspx?q=11ef6853-ceed-4ba7-9d87-4da407e23c10

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BSBMGT516 Facilitate continuous improvement

Modification History

Release	Comments
Release 1	This version first released with BSB Business Services Training Package Version 1.0.

Application

This unit describes the skills and knowledge required to lead and manage continuous improvement systems and processes. Particular emphasis is on the development of systems and the analysis of information to monitor and adjust performance strategies, and to manage opportunities for further improvements.

It applies to individuals who take an active role in managing a continuous improvement process in order to achieve an organisation's objectives.

At this level, work will normally be carried out using complex and diverse methods and procedures which require the exercise of considerable discretion and judgement, using a range of problem-solving and decision-making strategies.

No licensing, legislative or certification requirements apply to this unit at the time of publication.

Unit Sector

Management and leadership – Management

Elements and Performance Criteria

ELEMENT	PERFORMANCE CRITERIA
Elements describe the essential outcomes.	*Performance criteria describe the performance needed to demonstrate achievement of the element.*
1. Lead continuous improvement systems and processes	1.1 Develop strategies to ensure that team members are actively encouraged and supported to participate in decision-making processes, assume responsibility and exercise initiative as

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ELEMENT	PERFORMANCE CRITERIA
	appropriate 1.2 Establish systems to ensure that the organisation's continuous improvement processes are communicated to stakeholders 1.3 Ensure that change and improvement processes meet sustainability requirements 1.4 Develop effective mentoring and coaching processes to ensure that individuals and teams are able to implement and support the organisation's continuous improvement processes 1.5 Ensure that insights and experiences from business activities are captured and accessible through knowledge management systems
2. Monitor and adjust performance strategies	2.1 Develop strategies to ensure that systems and processes are used to monitor operational progress and to identify ways in which planning and operations could be improved 2.2 Adjust and communicate strategies to stakeholders according to organisational procedures
3. Manage opportunities for further improvement	3.1 Establish processes to ensure that team members are informed of outcomes of continuous improvement efforts 3.2 Ensure processes include recording of work team performance to assist in identifying further opportunities for improvement 3.3 Consider areas identified for further improvement when undertaking future planning

Foundation Skills

This section describes language, literacy, numeracy and employment skills incorporated in the performance criteria that are required for competent performance.

Skill	Performance Criteria	Description
Reading	1.2, 1.3, 1.4, 1.5, 2.1, 2.2, 3.3	• Identifies and extracts relevant information from a range of complex texts • Locates, interprets and analyses workplace documentation to gather information relating to continuous improvement
Writing	1.1, 1.2, 1.4, 1.5, 2.1, 2.2, 3.1-3.3	• Develops complex texts related to continuous improvement processes according to organisational requirements

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		• Ensures the vocabulary, grammatical structures and conventions are appropriate for the context and target audience
Oral Communication	1.1, 1.2, 1.4, 2.2	• Presents information to a range of audiences using appropriate structure and language • Listens and comprehends information from a variety of spoken exchanges with clients, co-workers and other stakeholders • Confirms understanding through questioning and active listening
Navigate the world of work	1.1-1.3, 2.1, 2.2	• Develops strategies to enable compliance with legislative requirements and achievement of the organisation's goals • Monitors adherence to organisational policies, procedures and protocols and considers own role in terms of its contribution to broader goals of the work environment
Interact with others	1.1, 1.2, 1.4, 2.2	• Identifies and uses appropriate conventions and protocols when communicating with colleagues and external stakeholders • Collaborates with others to achieve joint outcomes, playing an active role in facilitating effective group interaction and influencing direction
Get the work done	1.1, 1.2, 1.4, 1.5, 2.1, 3.1, 3.2, 3.3	• Takes responsibility for developing, implementing and monitoring systems and processes to achieve organisational outcomes • Uses analytical and lateral thinking to review current practices and develop ideas for improvement • Reflects on the ways in which digital systems and tools are used, or could be used, to achieve work goals

Unit Mapping Information

Code and title current version	**Code and title previous version**	**Comments**	**Equivalence status**
BSBMGT516 Facilitate continuous improvement	BSBMGT516C Facilitate continuous improvement	Updated to meet Standards for Training Packages	Equivalent unit

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Links

Companion Volume implementation guides are found in VETNet - https://vetnet.gov.au/Pages/TrainingDocs.aspx?q=11ef6853-ceed-4ba7-9d87-4da407e23c10

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Assessment Requirements for BSBMGT516 Facilitate continuous improvement

Modification History

Release	Comments
Release 1	This version first released with BSB Business Services Training Package Version 1.0.

Performance Evidence

Evidence of the ability to establish systems and processes for continuous improvement that:

- facilitate effective contributions to and communications about continuous improvement processes and outcomes
- address sustainability requirements
- incorporate mentoring, coaching and other support to enable people to participate effectively in continuous improvement processes
- capture insights, experiences and ideas for improvements and incorporate them into the organisation's knowledge management systems and future planning.

Note: If a specific volume or frequency is not stated, then evidence must be provided at least once.

Knowledge Evidence

To complete the unit requirements safely and effectively, the individual must:

- explain how systems and procedures can support effective continuous improvement
- explain how continuous improvement systems and processes relate to other business systems and requirements including, knowledge management, quality, performance management and sustainability.

Assessment Conditions

Assessment must be conducted in a safe environment where evidence gathered demonstrates consistent performance of typical activities experienced in the management and leadership field of work and include access to:

- relevant workplace documentation and resources
- case studies and, where possible, real situations
- interaction with others.

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Assessors must satisfy NVR/AQTF assessor requirements.

Links

Companion Volume implementation guides are found in VETNet - https://vetnet.gov.au/Pages/TrainingDocs.aspx?q=11ef6853-ceed-4ba7-9d87-4da407e23c10

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BSBMGT517 Manage operational plan

Modification History

Release	Comments
Release 1	This version first released with BSB Business Services Training Package Version 1.0.

Application

This unit describes the skills and knowledge required to develop and monitor implementation of the operational plan to provide efficient and effective workplace practices within the organisation's productivity and profitability plans.

Management at a strategic level requires systems and procedures to be developed and implemented to facilitate the organisation's operational plan.

This unit applies to individuals who manage the work of others and operate within the parameters of a broader strategic and/or business plan.

No licensing, legislative or certification requirements apply to this unit at the time of publication.

Unit Sector

Management and Leadership – Management

Elements and Performance Criteria

ELEMENT	PERFORMANCE CRITERIA
Elements describe the essential outcomes.	*Performance criteria describe the performance needed to demonstrate achievement of the element.*
1. Develop operational plan	1.1 Research, analyse and document resource requirements and develop an operational plan in consultation with relevant personnel, colleagues and specialist resource managers 1.2 Develop and/or implement consultation processes as an

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ELEMENT	PERFORMANCE CRITERIA
	integral part of the operational planning process 1.3 Ensure the operational plan includes key performance indicators to measure organisational performance 1.4 Develop and implement contingency plans for the operational plan 1.5 Ensure the development and presentation of proposals for resource requirements is supported by a variety of information sources and seek specialist advice as required 1.6 Obtain approval for the plan from relevant parties and explain the plan to relevant work teams
2. Plan and manage resource acquisition	2.1 Develop and implement strategies to ensure that employees are recruited and/or inducted within the organisation's human resources management policies, practices and procedures 2.2 Develop and implement strategies to ensure that physical resources and services are acquired in accordance with the organisation's policies, practices and procedures 2.3 Recognise and incorporate requirements for intellectual property rights and responsibilities in recruitment and acquisition of resources and services
3. Monitor and review operational performance	3.1 Develop, monitor and review performance systems and processes to assess progress in achieving profit and productivity plans and targets 3.2 Analyse and interpret budget and actual financial information to monitor and review profit and productivity performance 3.3 Identify areas of under-performance, recommend solutions and take prompt action to rectify the situation 3.4 Plan and implement systems to ensure that mentoring and coaching are provided to support individuals and teams to effectively, economically and safely use resources 3.5 Negotiate recommendations for variations to operational plans and gain approval from designated persons/groups 3.6 Develop and implement systems to ensure that procedures and records associated with documenting performance are managed in accordance with organisational requirements

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Foundation Skills

This section describes language, literacy, numeracy and employment skills incorporated in the performance criteria that are required for competent performance.

Skill	Performance Criteria	Description
Reading	1.1, 1.5, 2.1, 2.2, 3.1, 3.2, 3.3, 3.4, 3.6	• Identifies and extracts relevant information from a range of complex texts • Gathers, interprets and analyses workplace documentation to determine requirements for the operational plan
Writing	1.1-1.5, 2.1, 2.2, 3.1-3.6	• Develops and documents a range of detailed texts relating to the management of an operational plan according to organisational requirements • Ensures the vocabulary, grammatical structures and conventions are appropriate for the context and target audience
Oral Communication	1.1, 1.2, 1.5, 1.6, 3.4, 3.5	• Presents information to a range of audiences using appropriate register, vocabulary and paralinguistic features • Listens and comprehends information from a variety of spoken exchanges with clients, co-workers and other stakeholders • Confirms understanding through questioning and active listening
Numeracy	1.1, 1.3, 1.4, 3.1-3.4	• Selects and uses mathematical problem-solving strategies to organise resource requirements, performance benchmarks and financial viability of the operational plan
Navigate the world of work	2.1, 2.2, 3.4, 3.6	• Monitors adherence to organisational policies, procedures and considers own role in terms of its contribution to broader goals of the work environment • Appreciates the implications of legal responsibilities with specific reference to health and safety
Interact with others	1.1, 1.2, 1.5, 1.6, 3.5	• Identifies and uses appropriate conventions and protocols when communicating with colleagues and external stakeholders • Collaborates with others to achieve joint outcomes, playing an active role in facilitating effective group interaction, influencing direction and taking a leadership role on occasion
Get the work done	1.1-1.5, 2.1, 2.2, 3.1, 3.3, 3.4, 3.6	• Takes responsibility for developing and implementing systems and processes to achieve organisational objectives, seeking advice, feedback and support as

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		required to assist in the development and planning phase • Sequences and schedules complex activities, monitors implementation, and manages relevant communication • Uses systematic analytical processes to aid decision making, identify potential problems and generate contingency plans or solutions

Unit Mapping Information

Code and title current version	**Code and title previous version**	**Comments**	**Equivalence status**
BSBMGT517 Manage operational plan	BSBMGT515A Manage operational plan	Updated to meet Standards for Training Packages. Edits to clarify intent of Performance Criteria. Additional performance criterion and evidence for intellectual property.	No equivalent unit

Links

Companion Volume implementation guides are found in VETNet - https://vetnet.gov.au/Pages/TrainingDocs.aspx?q=11ef6853-ceed-4ba7-9d87-4da407e23c10

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Assessment Requirements for BSBMGT517 Manage operational plan

Modification History

Release	Comments
Release 1	This version first released with BSB Business Services Training Package Version 1.0.

Performance Evidence

Evidence of the ability to:

- develop and implement an operational plan using a variety of information sources and consultation (including using specialist advice if required) which includes:
  - resource requirements
  - key performance indicators
  - monitoring processes
  - contingency plans
- communicate effectively with relevant stakeholders to explain the plan and supporting information, seek approvals, negotiate variations and engage work teams
- develop and implement strategies to achieve the operational plan within the organisation's policies, practices and procedures including:
  - recruiting, inducting and developing personnel
  - acquiring physical resources and services
  - protecting intellectual property
  - making variations to the plan
  - monitoring and documenting performance.

Note: If a specific volume or frequency is not stated, then evidence must be provided at least once.

Knowledge Evidence

To complete the unit requirements safely and effectively, the individual must:

- describe models and methods for operational plans
- explain the role of an operational plan in achieving the organisation's objectives
- explain budgeting processes

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- list alternative approaches to developing key performance indicators to meet business objectives
- outline the legislative and regulatory context relevant to the operational plan of the organisation
- outline the organisation's policies, practices and procedures that directly relate to the operational plan.

Assessment Conditions

Assessment must be conducted in a safe environment where evidence gathered demonstrates consistent performance of typical activities experienced in the management and leadership field of work and include access to:

- relevant legislation and regulations
- workplace documentation and resources
- case studies and, where possible, real situations
- interaction with others.

Assessors must satisfy NVR/AQTF assessor requirements.

Links

Companion Volume implementation guides are found in VETNet - https://vetnet.gov.au/Pages/TrainingDocs.aspx?q=11ef6853-ceed-4ba7-9d87-4da407e23c10

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BSBWHS501 Ensure a safe workplace

Modification History

Release	Comments
Release 1	This version first released with BSB Business Services Training Package Version 1.0.

Application

This unit describes the skills and knowledge required to establish, maintain and evaluate the organisation's work health and safety (WHS) policies, procedures and programs in the relevant work area, according to WHS legislative requirements. It takes a systems approach and addresses compliance with relevant legislative requirements.

This unit applies to managers working in a range of contexts who have, or are likely to have responsibility for WHS as part of their broader management role. It is relevant for people with obligations under WHS legislation, for example persons conducting a business or undertaking (PCBUs) or officers, as defined by relevant legislation.

NOTE: The terms 'occupational health and safety' (OHS) and 'work health and safety' (WHS) are equivalent and generally either can be used in the workplace. In jurisdictions where the Model WHS Legislation has not been implemented RTOs are advised to contextualise the unit of competency by referring to the existing State/Territory OHS legislative requirements.

No licensing, legislative or certification requirements apply to this unit at the time of publication.

Unit Sector

Regulation, Licensing and Risk – Work Health and Safety

Elements and Performance Criteria

ELEMENT	PERFORMANCE CRITERIA
Elements describe the essential outcomes.	*Performance criteria describe the performance needed to demonstrate achievement of the element.*

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ELEMENT	PERFORMANCE CRITERIA
1 Establish a WHS management system in a work area	1.1 Locate, adapt, adopt and communicate WHS policies that clearly define the organisation's commitment to complying with WHS legislation 1.2 Identify duty holders and define WHS responsibilities for all workplace personnel in the work area according to WHS legislation, policies, procedures and programs 1.3 Identify and approve financial and human resources required by the WHS management system (WHSMS)
2 Establish and maintain effective and compliant participation arrangements for managing WHS in a work area	2.1 Work with workers and their representatives to set up and maintain participation arrangements according to relevant WHS legislation 2.2 Appropriately resolve issues raised through participation and consultation arrangements according to relevant WHS legislation 2.3 Promptly provide information about the outcomes of participation and consultation to workers and ensure it is easy for them to access and understand
3 Establish and maintain procedures for effectively identifying hazards, and assessing and controlling risks in a work area	3.1 Develop procedures for ongoing hazard identification, and assessment and control of associated risks 3.2 Include hazard identification at the planning, design and evaluation stages of any change in the workplace to ensure that new hazards are not created by the proposed changes and existing hazards are controlled 3.3 Develop and maintain procedures for selecting and implementing risk controls according to the hierarchy of control and WHS legislative requirements 3.4 Identify inadequacies in existing risk controls according to the hierarchy of control and WHS legislative requirements, and promptly provide resources to enable implementation of new measures 3.5 Identify requirements for expert WHS advice, and request this advice as required
4 Evaluate and maintain a work area WHS management system	4.1 Develop and provide a WHS induction and training program for all workers in a work area as part of the organisation's training program 4.2 Use a system for WHS record keeping to allow identification of patterns of occupational injury and disease in the organisation, and to maintain a record of WHS decisions made, including reasons for the decision 4.3 Measure and evaluate the WHSMS in line with the

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ELEMENT	PERFORMANCE CRITERIA
	organisation's quality systems framework 4.4 Develop and implement improvements to the WHSMS to achieve organisational WHS objectives 4.5 Ensure compliance with the WHS legislative framework to achieve, as a minimum, WHS legal requirements

Foundation Skills

This section describes language, literacy, numeracy and employment skills incorporated in the performance criteria that are required for competent performance.

Skill	Performance Criteria	Description
Reading	1.1, 1.2, 4.2, 4.3, 4.5	• Organises, evaluates and critiques ideas and information from WHS legislation, policies, procedures and programs
Writing	1.1, 2.3, 3.2, 3.5, 4.1, 4.2	• Produces WHS policies, procedures and programs • using appropriate vocabulary, grammatical structure and conventions to produce • Records WHS decisions according to organisational requirements
Oral communication	1.1, 2.1, 2.2, 2.3	• Presents and seeks information from others using structure and language suitable for the audience • Provides information on resolution of WHS issues varying level of technical vocabulary to suit audience
Numeracy	1.3	• Selects from, and applies, an expanding range of mathematical and problem solving strategies in identifying financial and human resources required
Navigate the world of work	1.1, 1.2, 2.1, 2.2, 3.3, 3.4, 4.5	• Monitors adherence to legal and regulatory rights and responsibilities for self and others in relation to WHS • Takes responsibility for developing, implementing and reviewing policies, procedures and processes in accordance with organisational and legislative requirements
Interact with others	1.1, 2.1, 2.3, 3.5	• Plays a lead role in situations requiring effective collaboration demonstrating the ability to guide discussions and negotiate agreeable outcomes • Provides feedback to others in forms they can

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		understand and use
Get the work done	1.1, 1.3, 2.1, 2.2, 2.3, 3.2, 3.3, 3.4, 3.5, 4.1, 4.2 4.3, 4.4, 4.5	• Develops plans or processes to manage relatively complex, WHS management tasks with an awareness of how they contribute to operational and strategic goals • Uses systematic, analytical processes, setting goals, gathering relevant information, and identifying and evaluating options against agreed criteria • Considers whether, and how, others should be involved, using consultative or collaborative processes as an integral part of the decision-making process • Uses digital systems and tools to enter, store and retrieve relevant information

Range of Conditions

This section specifies different work environments and conditions that may affect performance. Essential operating conditions that may be present (depending on the work situation, needs of the candidate, accessibility of the item, and local industry and regional contexts) are included.

WHS legislation must include:	• applicable Commonwealth and state or territory WHS Acts, regulations and codes of practice.

Unit Mapping Information

Code and title current version	**Code and title previous version**	**Comments**	**Equivalence status**
BSBWHS501 Ensure a safe workplace	BSBWHS501A Ensure a safe workplace	Updated to meet Standards for Training Packages	Equivalent unit

Links

Companion Volume implementation guides are found in VETNet - https://vetnet.gov.au/Pages/TrainingDocs.aspx?q=11ef6853-ceed-4ba7-9d87-4da407e23c10

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Assessment Requirements for BSBWHS501 Ensure a safe workplace

Modification History

Release	Comments
Release 1	This version first released with BSB Business Services Training Package Version 1.0.

Performance Evidence

Evidence of the ability to:

- establish, implement, maintain and evaluate a work health and safety (WHS) management system for a work area of an organisation in accordance with WHS legislation including policies, procedures and record keeping
- ensure organisational WHS compliance
- establish, implement, maintain and evaluate effective and compliant participation arrangements for managing WHS including identifying duty holders, identifying and approving the required resources and developing and implementing a training program
- establish, implement, maintain and evaluate procedures for effectively identifying hazards, and assessing and controlling risks using the hierarchy of risk control
- provide information and complete documentation for a WHS management system
- identify requirements for and request expert WHS advice.

Note: If a specific volume or frequency is not stated, then evidence must be provided at least once.

Knowledge Evidence

To complete the unit requirements safely and effectively, the individual must:

- identify and detail relevant WHS Acts, regulations and codes of practice
- specify relevant WHS organisational policies, procedures, programs and practices
- explain hazard identification and risk-management processes
- describe the hierarchy of risk control and how it is applied in the workplace
- specify in-house and WHS legislative reporting requirements.

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Assessment Conditions

Assessment must be conducted in a safe environment where evidence gathered demonstrates consistent performance of typical activities experienced by individuals carrying out work health and safety duties in the workplace and include access to:

- organisational WHS policies and procedures
- WHS legislation, regulations and codes of practice
- case studies and, where possible, real situations
- interaction with others.

Assessors must satisfy NVR/AQTF assessor requirements.

Links

Companion Volume implementation guides are found in VETNet - https://vetnet.gov.au/Pages/TrainingDocs.aspx?q=11ef6853-ceed-4ba7-9d87-4da407e23c10

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BSBWOR301 Organise personal work priorities and development

Modification History

Release	Comments
Release 1	This version first released with BSB Business Services Training Package Version 1.0.

Application

This unit describes the skills and knowledge required to organise own work schedules, to monitor and obtain feedback on work performance and to maintain required levels of competence.

This unit applies to individuals who exercise discretion and judgement and apply a broad range of competencies in various work contexts.

No licensing, legislative, regulatory or certification requirements apply to this unit at the time of publication.

Unit Sector

Industry Capability – Workplace Effectiveness

Elements and Performance Criteria

ELEMENT	PERFORMANCE CRITERIA
Elements describe the essential outcomes.	*Performance criteria describe the performance needed to demonstrate achievement of the element.*
1. Organise and complete own work schedule	1.1 Ensure that work goals, objectives or Key Performance Indicators (KPIs) are understood, negotiated and agreed in accordance with organisational requirements 1.2 Assess and prioritise workload to ensure tasks are completed within identified timeframes 1.3 Identify factors affecting the achievement of work objectives and incorporate contingencies into work plans 1.4 Use business technology efficiently and effectively to manage

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ELEMENT	PERFORMANCE CRITERIA
	and monitor scheduling and completion of tasks
2. Monitor own work performance	2.1 Accurately monitor and adjust personal work performance through self assessment to ensure achievement of tasks and compliance with legislation and work processes or KPIs 2.2 Ensure that feedback on performance is actively sought and evaluated from colleagues and clients in the context of individual and group requirements 2.3 Routinely identify and report on variations in the quality of and products and services according to organisational requirements 2.4 Identify signs of stress and effects on personal wellbeing 2.5 Identify sources of stress and access appropriate supports and resolution strategies
3. Co-ordinate personal skill development and learning	3.1 Identify personal learning and professional development needs and skill gaps using self assessment and advice from colleagues and clients in relation to role and organisational requirements 3.2 Identify, prioritise and plan opportunities for undertaking personal skill development activities in liaison with work groups and relevant personnel 3.3 Access, complete and record professional development opportunities to facilitate continuous learning and career development 3.4 Incorporate formal and informal feedback into review of further learning needs

Foundation Skills

This section describes language, literacy, numeracy and employment skills incorporated in the performance criteria that are required for competent performance.

Skill	Performance Criteria	Description
Learning	3.1-3.4	• Employs a range of approaches and investigative techniques to source the knowledge necessary to arrange personal learning experiences
Reading	1.1, 1.2, 2.1	• Interprets textual information to determine organisation's procedures, own work performance and objectives

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Writing	1.3, 1.4, 2.3, 3.1, 3.2, 3.3	• Prepares written reports and workplace documents that communicate information clearly and effectively
Oral Communication	2.2, 2.3, 3.1, 3.2	• Clearly gives and receives feedback using specific and relevant language • Uses listening and questioning techniques to confirm understanding
Numeracy	1.1, 1.3	• Understands responsibilities and scope of role and complies with organisational policies, procedures and protocols
Interact with others	1.1, 2.2, 2.3, 3.1, 3.2	• Selects the appropriate form, channel and mode of communication for a specific purpose relevant to own role • Fosters and nurtures a culture of constructive and respectful feedback • Proactively collaborates with others to achieve specific goals
Get the work done	1.2, 1.3, 1.4, 2.4, 2.5, 3.2	• Plans and organises work commitments to ensure deadlines and objectives are met • Uses formal analytical thinking techniques to recognise and respond to routine problems • Uses digital systems and tools to enter, store and monitor information

Unit Mapping Information

Code and title current version	**Code and title previous version**	**Comments**	**Equivalence status**
BSBWOR301 Organise personal work priorities and development	BSBWOR301B Organise personal work priorities and development	Updated to meet Standards for Training Packages	Equivalent unit

Links

Companion Volume implementation guides are found in VETNet - https://vetnet.gov.au/Pages/TrainingDocs.aspx?q=11ef6853-ceed-4ba7-9d87-4da407e23c10

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Assessment Requirements for BSBWOR301 Organise personal work priorities and development

Modification History

Release	Comments
Release 1	This version first released with BSB Business Services Training Package Version 1.0.

Performance Evidence

Evidence of the ability to:

- prepare a work plan according to organisational requirements and work objectives
- use business technology to schedule, prioritise and monitor completion of tasks in a work plan
- assess and prioritise own work load and deal with contingencies
- monitor and assess personal performance against job role requirements by seeking feedback from colleagues and clients
- identify personal development needs and access, complete and record skill development and learning.

Note: if a specific volume or frequency is not stated, then evidence must be provided at least once.

Knowledge Evidence

To complete the unit requirements safely and effectively, the individual must:

- outline key provisions of legislation that relate to own work role
- describe goals, objectives or key performance indicators of own work role
- explain ways to elicit, analyse and interpret feedback when communicating with other people in the workplace
- explain the principles and techniques of goal setting, measuring performance, time management and personal assessment of learning and development needs
- explain signs and sources of stress and strategies to deal with stress in the workplace
- identify methods to identify and prioritise personal learning needs.

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Assessment Conditions

Assessment must be conducted in a safe environment where evidence gathered demonstrates consistent performance of typical activities experienced in the industry capability - workplace effectiveness field of work and include access to:

- office equipment and resources
- work schedules and performance improvement plans
- workplace documentation and resources
- case studies and, where possible, real situations
- interaction with others.

Assessors must satisfy NVR/AQTF assessor requirements.

Links

Companion Volume implementation guides are found in VETNet - https://vetnet.gov.au/Pages/TrainingDocs.aspx?q=11ef6853-ceed-4ba7-9d87-4da407e23c10

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BSBWOR404 Develop work priorities

Modification History

Release	Comments
Release 2	This version first released with BSB Business Services Training Package Version 1.1. Version created to correct mapping table information
Release 1	This version first released with BSB Business Services Training Package Version 1.0.

Application

This unit describes the skills and knowledge required to monitor and obtain feedback on own work performance and access learning opportunities for professional development.

This unit applies to individuals who are required to design their own work schedules and work plans and to establish priorities for their work. They will typically hold some responsibilities for the work of others and have some autonomy in relation to their own role.

No licensing, legislative, regulatory or certification requirements apply to this unit at the time of publication.

Unit Sector

Industry Capability – Workplace Effectiveness

Elements and Performance Criteria

ELEMENT	PERFORMANCE CRITERIA
Elements describe the essential outcomes.	*Performance criteria describe the performance needed to demonstrate achievement of the element.*
1. Plan and complete own work schedule	1.1 Prepare workgroup plans which reflect consideration of resources, client needs and workgroup targets 1.2 Analyse and incorporate work objectives and priorities into personal schedules and responsibilities

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ELEMENT	PERFORMANCE CRITERIA
	1.3 Identify factors affecting the achievement of work objectives and establish contingencies and incorporate them into work plans 1.4 Efficiently and effectively use business technology to manage and monitor planning completion and scheduling of tasks
2. Monitor own work performance	2.1 Identify and analyse personal performance through self-assessment and feedback from others on the achievement of work objectives 2.2 Seek and evaluate feedback on performance from colleagues and clients in the context of individual and group requirements 2.3 Routinely identify and report on variations in the quality of service and performance in accordance with organisational requirements
3. Co-ordinate professional development	3.1 Assess personal knowledge and skills against organisational benchmarks to determine development needs and priorities 3.2 Research and identify sources and plan for opportunities for improvement in consultation with colleagues 3.3 Use feedback to identify and develop ways to improve competence within available opportunities 3.4 Identify, access and complete professional development activities to assist career development 3.5 Store and maintain records and documents relating to achievements and assessments in accordance with organisational requirements

Foundation Skills

This section describes language, literacy, numeracy and employment skills incorporated in the performance criteria that are required for competent performance.

Skill	Performance Criteria	Description
Learning	3.1, 3.2, 3.3, 3.4	• Develops strategies to reflect on own performance, obtain feedback, and plan and source professional development opportunities
Reading	1.2, 2.1, 2.3, 3.1, 3.5	• Recognises and interprets textual information from relevant sources to understand organisation's policies and practices

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Writing	1.1, 1.3, 2.2, 2.3, 3.2, 3.5	• Prepares written reports and workplace documentation that communicate complex information clearly and effectively
Oral Communication	2.2, 2.3, 3.2	• Provides or seeks information using language suitable to audience and context • Employs listening and questioning techniques to confirm understanding
Numeracy	1.1, 1.2, 1.3	• Interprets numerical information related to budgets and timeframes
Navigate the world of work	1.2, 2.1, 2.3, 3.1, 3.5	• Identifies and understands roles and responsibilities in relation to organisational objectives, policies and procedures
Interact with others	2.2, 2.3, 3.2	• Selects and uses appropriate practices when communicating with internal and external stakeholders to seek or share information • Establishes and builds rapport and relationships with others to foster a culture of trust and honesty in communications
Get the work done	1.1-1.4, 2.3, 3.1, 3.2, 3.4, 3.5	• Plans, organises and implements tasks to meet organisational requirements • Systematically gathers and analyses information and evaluates options in order to anticipate potential problems and develop contingency plans • Uses the main features and functions of digital technologies and tools to complete work tasks efficiently and effectively

Unit Mapping Information

Code and title current version	**Code and title previous version**	**Comments**	**Equivalence status**
BSBWOR404 Develop work priorities	BSBWOR404B Develop work priorities	Updated to meet Standards for Training Packages	Equivalent unit

Links

Companion Volume implementation guides are found in VETNet - https://vetnet.gov.au/Pages/TrainingDocs.aspx?q=11ef6853-ceed-4ba7-9d87-4da407e23c10

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Assessment Requirements for BSBWOR404 Develop work priorities

Modification History

Release	Comments
Release 2	This version first released with BSB Business Services Training Package Version 1.1. Version created to correct mapping table information
Release 1	This version first released with BSB Business Services Training Package Version 1.0.

Performance Evidence

Evidence of the ability to:

- prepare and communicate own work plan
- schedule work objectives and tasks to support the achievement of the workgroup goals
- review own work performance against workgroup objectives through self-assessment and seeking and acting on feedback from clients and colleagues
- plan and access learning opportunities to extend personal work competencies.

Note: if a specific volume or frequency is not stated, then evidence must be provided at least once.

Knowledge Evidence

To complete the unit requirements safely and effectively, the individual must:

- explain how business technology applications can be used to schedule tasks and plan work
- explain techniques to prepare personal plans and establish priorities
- identify methods to identify and prioritise personal learning needs
- outline a range of professional development options
- explain methods to elicit, analyse and interpret feedback
- provide a detailed explanation of methods that can be used to evaluate own performance.

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Assessment Conditions

Assessment must be conducted in a safe environment where evidence gathered demonstrates consistent performance of typical activities experienced in the industry capability - workplace effectiveness field of work and include access to:

- workplace documentation including policies and procedures, and benchmarks for work group productivity and performance
- workplace equipment and resources
- case studies and, where possible, real situations
- interaction with others.

Assessors must satisfy NVR/AQTF assessor requirements.

Links

Companion Volume implementation guides are found in VETNet - https://vetnet.gov.au/Pages/TrainingDocs.aspx?q=11ef6853-ceed-4ba7-9d87-4da407e23c10

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BSBWOR501 Manage personal work priorities and professional development

Modification History

Release	Comments
Release 1	This version first released with BSB Business Services Training Package Version 1.0.

Application

This unit describes the skills and knowledge required to create systems and process to organise information and prioritise tasks.

It applies to individuals working in managerial positions who have excellent organisational skills. The work ethic of individuals in this role has a significant impact on the work culture and patterns of behaviour of others as managers at this level are role models in their work environment.

No licensing, legislative, regulatory or certification requirements apply to this unit at the time of publication.

Unit Sector

Industry Capability – Workplace Effectiveness

Elements and Performance Criteria

ELEMENT	PERFORMANCE CRITERIA
Elements describe the essential outcomes.	*Performance criteria describe the performance needed to demonstrate achievement of the element.*
1. Establish personal work goals	1.1 Serve as a positive role model in the workplace through personal work planning 1.2 Ensure personal work goals, plans and activities reflect the organisation's plans, and own responsibilities and accountabilities 1.3 Measure and maintain personal performance in varying work conditions, work contexts and when contingencies occur

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ELEMENT	PERFORMANCE CRITERIA
2. Set and meet own work priorities	2.1 Take initiative to prioritise and facilitate competing demands to achieve personal, team and organisational goals and objectives 2.2 Use technology efficiently and effectively to manage work priorities and commitments 2.3 Maintain appropriate work-life balance, and ensure stress is effectively managed and health is attended to
3. Develop and maintain professional competence	3.1 Assess personal knowledge and skills against competency standards to determine development needs, priorities and plans 3.2 Seek feedback from employees, clients and colleagues and use this feedback to identify and develop ways to improve competence 3.3 Identify, evaluate, select and use development opportunities suitable to personal learning style/s to develop competence 3.4 Participate in networks to enhance personal knowledge, skills and work relationships 3.5 Identify and develop new skills to achieve and maintain a competitive edge

Foundation Skills

This section describes language, literacy, numeracy and employment skills incorporated in the performance criteria that are required for competent performance.

Skill	Performance Criteria	Description
Learning	3.1, 3.2, 3.3, 3.4, 3.5	• Investigates and uses a range of strategies to develop personal competence
Reading	1.2, 3.1, 3.2	• Analyses and interprets textual information from organisational policies and practices or feedback to inform personal development planning
Writing	3.2	• Uses feedback to prepare reports that summarise ways to improve competence
Oral Communication	3.2	• Uses active listening and questioning to seek and receive feedback
Navigate the world of work	1.2, 2.1	• Understands how own role contributes to broader organisational goals • Considers organisational protocols when planning own career development

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Interact with others	1.1, 3.2, 3.4	• Selects and uses appropriate conventions and protocols when communicating with diverse stakeholders • Uses interpersonal skills to establish and build positive working relationships with others
Get the work done	1.1, 1.2, 1.3, 2.1, 2.2, 2.3, 3.1	• Plans and prioritises tasks in order to meet deadlines, manage role responsibilities and to manage own personal welfare • Identifies and uses appropriate technology to improve work efficiency

Unit Mapping Information

Code and title current version	**Code and title previous version**	**Comments**	**Equivalence status**
BSBWOR501 Manage personal work priorities and professional development	BSBWOR501B Manage personal work priorities and professional development	Updated to meet Standards for Training Packages Minor edits to clarify Performance Criteria	Equivalent unit

Links

Companion Volume implementation guides are found in VETNet - https://vetnet.gov.au/Pages/TrainingDocs.aspx?q=11ef6853-ceed-4ba7-9d87-4da407e23c10

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Assessment Requirements for BSBWOR501 Manage personal work priorities and professional development

Modification History

Release	Comments
Release 1	This version first released with BSB Business Services Training Package Version 1.0.

Performance Evidence

Evidence of the ability to:

- use business technology to create and use systems and processes to organise and prioritise tasks and commitments
- measure and maintain personal work performance including assessing competency against competency standards and seeking feedback
- maintain an appropriate work-life balance to manage personal health and stress
- participate in networks
- develop a personal development plan which includes career objectives and an action plan
- develop new skills.

Note: if a specific volume or frequency is not stated, then evidence must be provided at least once.

Knowledge Evidence

To complete the unit requirements safely and effectively, the individual must:

- explain principles and techniques involved in the management and organisation of:
  - performance measurement
  - personal behaviour, self-awareness and personality traits identification
  - a personal development plan
  - personal goal setting
  - time
- discuss management development opportunities and options for self
- describe methods for achieving a healthy work-life balance
- outline organisation’s policies, plans and procedures
- explain types of learning style/s and how they relate to the individual
- describe types of work methods and practices that can improve personal performance.

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Assessment Conditions

Assessment must be conducted in a safe environment where evidence gathered demonstrates consistent performance of typical activities experienced in the industry capability - workplace effectiveness field of work and include access to:

- workplace equipment and resources
- case studies and, where possible, real situations
- interaction with others.

Assessors must satisfy NVR/AQTF assessor requirements.

Links

Companion Volume implementation guides are found in VETNet - https://vetnet.gov.au/Pages/TrainingDocs.aspx?q=11ef6853-ceed-4ba7-9d87-4da407e23c10

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BSBWOR502 Lead and manage team effectiveness

Modification History

Release	Comments
Release 1	This version first released with BSB Business Services Training Package Version 1.0.

Application

This unit describes the skills and knowledge required to lead teams in the workplace and to actively engage with the management of the organisation.

It applies to individuals working at a managerial level who facilitate work teams and build a positive culture within their work teams. At this level, work will normally be carried out using complex and diverse methods and procedures requiring the exercise of considerable discretion and judgement, using a range of problem solving and decision making strategies.

No licensing, legislative, regulatory or certification requirements apply to this unit at the time of publication.

Unit Sector

Industry Capability – Workplace Effectiveness

Elements and Performance Criteria

ELEMENT	PERFORMANCE CRITERIA
Elements describe the essential outcomes.	*Performance criteria describe the performance needed to demonstrate achievement of the element.*
1. Establish team performance plan	1.1 Consult team members to establish a common understanding of team purpose, roles, responsibilities and accountabilities in accordance with organisational goals, plans and objectives 1.2 Develop performance plans to establish expected outcomes, outputs, key performance indicators (KPIs) and goals for work team 1.3 Support team members in meeting expected performance

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ELEMENT	PERFORMANCE CRITERIA
	outcomes
2. Develop and facilitate team cohesion	2.1 Develop strategies to ensure team members have input into planning, decision making and operational aspects of work team 2.2 Develop policies and procedures to ensure team members take responsibility for own work and assist others to undertake required roles and responsibilities 2.3 Provide feedback to team members to encourage, value and reward individual and team efforts and contributions 2.4 Develop processes to ensure that issues, concerns and problems identified by team members are recognised and addressed
3. Facilitate teamwork	3.1 Encourage team members and individuals to participate in and to take responsibility for team activities, including communication processes 3.2 Support the team in identifying and resolving work performance problems 3.3 Ensure own contribution to work team serves as a role model for others and enhances the organisation's image for all stakeholders
4. Liaise with stakeholders	4.1 Establish and maintain open communication processes with all stakeholders 4.2 Communicate information from line manager/management to the team 4.3 Communicate unresolved issues, concerns and problems raised by team members and follow-up with line manager/management and other relevant stakeholders 4.4 Evaluate and take necessary corrective action regarding unresolved issues, concerns and problems raised by internal or external stakeholders

Foundation Skills

This section describes language, literacy, numeracy and employment skills incorporated in the performance criteria that are required for competent performance.

Skill	Performance Criteria	Description

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Reading	1.1, 4.4	• Analyses and interprets textual information from the organisation's policies, goals and objectives to establish team goals or to determine corrective action
Writing	1.2, 2.1, 2.2, 2.4, 4.2, 4.3, 4.4	• Prepares written reports and workplace documentation that communicate complex information clearly and effectively
Oral Communication	1.1, 2.3, 3.1, 4.1, 4.2, 4.3	• Engages in discussions or provides information using appropriate vocabulary and non-verbal features • Uses listening and questioning techniques to confirm understanding and to engage the audience
Navigate the world of work	1.1, 2.1, 2.2, 3.3	• Understands how own role contributes to broader organisational goals • Modifies or develops policies and procedures to achieve organisational goals
Interact with others	1.1, 1.3, 2.2, 2.3, 3.1, 3.2, 4.2, 4.3	• Selects and uses appropriate conventions and protocols when communicating with diverse stakeholders • Uses interpersonal skills to gain trust and confidence of team and provides feedback to others in forms that they can understand and use • Adapts personal communication style to build positive working relationships and to show respect for the opinions, values and particular needs of others • Plays a lead role in situations requiring effective collaboration, demonstrating high level conflict resolution skills and ability to engage and motivate others
Get the work done	1.2, 2.1, 2.2, 2.4, 3.2, 4.1, 4.3, 4.4	• Develops, implements and monitors plans and processes to ensure team effectiveness • Monitors and actively supports processes and development activities to ensure the team is focused on work outcomes • Plans for unexpected outcomes and implements creative responses to overcome challenges

Unit Mapping Information

Code and title current version	**Code and title previous version**	**Comments**	**Equivalence status**
BSBWOR502 Lead and manage team effectiveness	BSBWOR502B Ensure team effectiveness	Updated to meet Standards for Training Packages	Equivalent unit

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Code and title current version	Code and title previous version	Comments	Equivalence status
		Title change	

Links

Companion Volume implementation guides are found in VETNet - https://vetnet.gov.au/Pages/TrainingDocs.aspx?q=11ef6853-ceed-4ba7-9d87-4da407e23c10

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Assessment Requirements for BSBWOR502 Lead and manage team effectiveness

Modification History

Release	Comments
Release 1	This version first released with BSB Business Services Training Package Version 1.0.

Performance Evidence

Evidence of the ability to:

- use leadership techniques and strategies to facilitate team cohesion and work outcomes including:
  - encouraging and fostering shared understanding of purpose, roles and responsibilities
  - identifying and resolving problems
  - providing feedback to encourage, value and reward others
  - modelling desired behaviour and practices
- develop policies and procedures to ensure team members take responsibility for own work and assist others to undertake required roles and responsibilities
- establish processes to address issues and resolve performance issues
- support team to meet expected performance outcomes including providing formal and informal learning opportunities as needed
- develop performance plans with key performance indicators (KPIs), outputs and goals for individuals or the team which incorporate input from stakeholders
- communicate effectively with a range of stakeholders about team performance plans and team performance
- facilitate two-way flow of information between team and management relevant to team performance
- evaluate and take necessary corrective action regarding unresolved issues, concerns and problems raised by internal or external stakeholders.

Note: if a specific volume or frequency is not stated, then evidence must be provided at least once.

Knowledge Evidence

To complete the unit requirements safely and effectively, the individual must:

- explain how group dynamics can support or hinder team performance

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- outline strategies that can support team cohesion, participation and performance
- explain strategies for gaining consensus
- explain issue resolution strategies.

Assessment Conditions

Assessment must be conducted in a safe environment where evidence gathered demonstrates consistent performance of typical activities experienced in the industry capability - workplace effectiveness field of work and include access to:

- workplace documents
- case studies and, where possible, real situations
- office equipment and resources
- interaction with others.

Assessors must satisfy NVR/AQTF assessor requirements.

Links

Companion Volume implementation guides are found in VETNet - https://vetnet.gov.au/Pages/TrainingDocs.aspx?q=11ef6853-ceed-4ba7-9d87-4da407e23c10

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CPCCCM2007B Use explosive power tools

Modification History

Minor changes made to range statement, including addition of photovoltaic (solar) panels

Equivalent to CPCCCM2007A

Unit Descriptor

This unit of competency specifies the outcomes required to apply safe and effective operation of explosive power tools (EPT), used to fasten materials or fix fasteners to bases. It includes both direct action and indirect action explosive powered fastening tools.

Application of the Unit

This unit of competency supports achievement of skills to safely and effectively use a range of EPT used in the construction industry.

Licensing/Regulatory Information

Not applicable.

Pre-Requisites

CPCCOHS2001A	Apply OHS requirements, policies and procedures in the construction industry

Employability Skills Information

This unit contains employability skills.

Elements and Performance Criteria Pre-Content

Elements describe the essential outcomes of a unit of competency.	Performance criteria describe the performance needed to demonstrate achievement of the element. Where bold italicised text is used, further information is detailed in the required skills and knowledge section and the range statement. Assessment of performance is to be consistent with the evidence guide.

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Elements and Performance Criteria

1	Plan and prepare.	1.1	Work instructions, including plans, specifications, quality requirements and operational details, are obtained, confirmed and applied from relevant ***information*** for ***planning and preparation***.
		1.2	***Safety (OHS)*** requirements are followed in accordance with safety plans and policies.
		1.3	Signage and barricade requirements are identified and implemented.
		1.4	Plant, ***tools and equipment*** selected to carry out tasks are consistent with job requirements, checked for serviceability, and any faults are rectified or reported prior to commencement.
		1.5	Material quantity requirements are calculated in accordance with plans and specifications.
		1.6	***Materials*** appropriate to work application are identified, obtained, prepared, safely handled and located ready for use.
		1.7	***Environmental requirements*** are identified for the project in accordance with environmental plans and ***statutory and regulatory authority*** obligations, and are applied.
2	Set out fasteners.	2.1	***Minimum distances for set out*** from edge of substrate material are adhered to in accordance with legislation, regulations and codes of practice.
		2.2	Material is located and temporarily held or fixed into designed position according to detailed drawings.
3	Use EPT.	3.1	EPT is checked for operation according to manufacturer specifications and safety (OHS) requirements for ***use of EPT***.
		3.2	Fastener is selected according to requirements of job.
		3.3	Charge is selected to assessed requirements for material,

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			base and penetration.
		3.4	***Attachments*** and accessories are installed to EPT in accordance with manufacturer specifications and safety (OHS) requirements.
		3.5	***Fastener and charge*** in EPT are located to manufacturer specifications.
		3.6	EPT operation is carried out and fastener is fixed into place in accordance with manufacturer recommendations, legislation, regulations and codes of practice.
		3.7	Fastening penetration is checked and appropriate depth into material is applied.
		3.8	Power regulating device is adjusted for conditions.
		3.9	Misfire procedures are carried out according to manufacturer recommendations, legislation, regulations and codes of practice.
		3.10	Temporary holding and fixings are removed without damage to material.
4	Secure and store equipment and charges.	4.1	Charges are stored in designated container in accordance with legislation, regulations and codes of practice and used charges are recorded.
		4.2	Unused fasteners, the EPT and attachments are stored in a carry case in line with manufacturer recommendations.
		4.3	Logbook is checked and maintenance recorded according to manufacturer recommendations.
5	Maintain EPT and kit.	5.1	Safety features of tools are checked for serviceability in accordance with manufacturer operating manual.
		5.2	Tools are cleaned and lubricated to manufacturer recommendations.
		5.3	Periodic maintenance service is carried out to manufacturer specifications.
		5.4	Diminished stocks of charges and fasteners are

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			replenished to designed effectiveness of EPT kit.
6	Clean up.	6.1	Work area is cleared and materials disposed of, reused or recycled in accordance with legislation, regulations, codes of practice and job specification.
		6.2	Plant, tools and equipment are cleaned, checked, maintained and stored in accordance with manufacturer recommendations and standard work practices.

Required Skills and Knowledge

This section describes the skills and knowledge required for this unit.

Required skills

Required skills for this unit are:

- communication skills to:
  - determine requirements
  - enable clear and direct communication, using questioning to identify and confirm requirements, share information, listen and understand
  - follow instructions
  - read and interpret:
    - documentation from a variety of sources
    - drawings and specifications
  - report faults
  - use language and concepts appropriate to cultural differences
  - use and interpret non-verbal communication, such as hand signals
  - written skills to record maintenance in logbook
- identifying and accurately reporting to appropriate personnel any faults in tools, equipment or materials
- numeracy skills to apply measurements and make calculations
- organisational skills, including the ability to plan and set out work
- teamwork skills to work with others to action tasks and relate to people from a range of cultural and ethnic backgrounds and with varying physical and mental abilities
- technological skills to:
  - use a range of mobile technology, such as two-way radio and mobile phones
  - voice and hand signals to access and understand site-specific instructions.

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Required knowledge

Required knowledge for this unit is:

- construction terminology
- EPT materials
- EPT charges and fasteners
- equipment safety manuals and instructions
- job safety analysis (JSA) and safe work method statements
- material safety data sheets (MSDS)
- materials storage and environmentally friendly waste management
- plans, specifications and drawings
- processes for the calculation of material requirements
- quality requirements
- relevant Acts, regulations and codes of practice
- security and storage procedures for equipment and charges
- types, characteristics, uses and limitations of plant, tools and equipment
- workplace and equipment safety requirements.

Evidence Guide

The evidence guide provides advice on assessment and must be read in conjunction with the performance criteria, required skills and knowledge, range statement and the Assessment Guidelines for the Training Package.

Overview of assessment	This unit of competency could be assessed in the workplace or a close simulation of the workplace environment, provided that simulated or project-based assessment techniques fully replicate construction workplace conditions, materials, activities, responsibilities and procedures.
Critical aspects for assessment and evidence required to demonstrate competency in this unit	A person who demonstrates competency in this unit must be able to provide evidence of the ability to: • locate, interpret and apply relevant information, standards and specifications • comply with site safety plan and OHS legislation, regulations and codes of practice applicable to workplace operations • comply with organisational policies and

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procedures, including quality requirements
- safely and effectively use tools and equipment
- communicate and work effectively and safely with others
- fix metal or timber to a steel, concrete or masonry base on one project of each to job specifications, including:
  - completion of stripping and assembly of the tool
  - completing log of serviceability
  - maintaining and cleaning
  - selecting charges and fasteners applicable to base material and material being fixed
  - misfire procedures
  - using attachments
  - complying with storage and security regulations and OHS requirements for the working environment
  - selecting signage
  - test fire.

Context of and specific resources for assessment

This competency is to be assessed using standard and authorised work practices, safety requirements and environmental constraints.

Assessment of essential underpinning knowledge will usually be conducted in an off-site context.

Assessment is to comply with relevant regulatory or Australian standards' requirements.

Resource implications for assessment include:

- an induction procedure and requirement
- realistic tasks or simulated tasks covering the mandatory task requirements
- relevant specifications and work instructions
- tools and equipment appropriate to applying safe work practices
- support materials appropriate to activity
- workplace instructions relating to safe work practices and addressing hazards and emergencies
- material safety data sheets
- research resources, including industry related systems information.

Reasonable adjustments for people with disabilities

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must be made to assessment processes where required. This could include access to modified equipment and other physical resources, and the provision of appropriate assessment support.

Method of assessment

Assessment methods must:

- satisfy the endorsed Assessment Guidelines of the Construction, Plumbing and Services Training Package
- include direct observation of tasks in real or simulated work conditions, with questioning to confirm the ability to consistently identify and correctly interpret the essential underpinning knowledge required for practical application
- reinforce the integration of employability skills with workplace tasks and job roles
- confirm that competency is verified and able to be transferred to other circumstances and environments.

Validity and sufficiency of evidence requires that:

- competency will need to be demonstrated over a period of time reflecting the scope of the role and the practical requirements of the workplace
- where the assessment is part of a structured learning experience the evidence collected must relate to a number of performances assessed at different points in time and separated by further learning and practice, with a decision on competency only taken at the point when the assessor has complete confidence in the person's demonstrated ability and applied knowledge
- all assessment that is part of a structured learning experience must include a combination of direct, indirect and supplementary evidence.

Assessment processes and techniques should as far as is practical take into account the language, literacy and numeracy capacity of the candidate in relation to the competency being assessed.

Supplementary evidence of competency may be obtained from relevant authenticated documentation from third parties, such as existing supervisors, team leaders or specialist training staff.

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Range Statement

The range statement relates to the unit of competency as a whole. It allows for different work environments and situations that may affect performance. Bold italicised wording, if used in the performance criteria, is detailed below. Essential operating conditions that may be present with training and assessment (depending on the work situation, needs of the candidate, accessibility of the item, and local industry and regional contexts) may also be included.

Information includes:

- diagrams or sketches
- instructions issued by authorised organisational or external personnel
- manufacturer specifications and instructions where specified
- memos
- MSDS
- organisation work specifications and requirements
- plans and specifications
- regulatory and legislative requirements pertaining to using EPT
- relevant Australian standards
- safe work procedures related to using EPT
- signage
- verbal or written and graphical instructions
- work bulletins
- work schedules.

Planning and preparation include:

- work site inspection
- equipment defect identification
- assessment of conditions and hazards
- determination of work requirements.

Safety (OHS) is to be in accordance with legislation, regulations, codes of practice, organisational safety policies and procedures, and project safety plan and may include:

- emergency procedures, including extinguishing fires, organisational first aid requirements and evacuation
- handling of materials
- hazard control
- hazardous materials and substances
- safe operating procedures, including the conduct of operational risk assessment and treatments associated with:
  - earth leakage boxes

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- lighting
- photovoltaic (solar) panels
- power cables, including overhead service trays, cables and conduits
- restricted access barriers
- surrounding structures
- traffic control
- trip hazards
- work site visitors and the public
- working at heights
- working in confined spaces
- working in proximity to others
- working with dangerous materials

- organisational first aid
- personal protective clothing and equipment prescribed under legislation, regulations and workplace policies and practices
- use of firefighting equipment
- use of tools and equipment
- workplace environment and safety.

Tools and equipment may include:

- direct action EPT
- indirect action EPT
- clamps and levels.

Materials include:

- timber
- metals
- patented fasteners.

Environmental requirements include:

- clean-up management
- noise and dust
- vibration
- waste management.

Statutory and regulatory authorities include:

- federal, state and local authorities administering applicable Acts, regulations and codes of practice.

Minimum distance for set out of

- regulated minimum distances
- bases, including concrete, masonry or steel.

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fasteners is to be in accordance with:

Use of EPT includes:

- stripping and assembling tools
- completing log of serviceability
- maintaining and cleaning tools
- selecting charges and fasteners applicable to the base material and material being fixed
- misfire procedures
- using attachments
- complying with storage and security regulations and OHS requirements for the working environment
- selecting signage
- test fire.

Attachments include:

- channel, rebate and other manufacturer attachments.

Fastener and charge include:

- firing a test shot with misfire procedures, complying with the regulated safety procedure for misfire.

Unit Sector(s)

Functional area

Unit sector Construction

Custom Content Section

Not applicable.

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CPCCLDG3001A Licence to perform dogging

Modification History

Not Applicable

Unit Descriptor

Unit descriptor This unit specifies the outcomes required to perform slinging techniques, including the selection and inspection of lifting gear and/or the directing of the crane operator in the movement of the load when the load is out of view of the crane/ operator for licensing purposes.

Application of the Unit

Application of the unit

This unit covers the scope of work to demonstrate competency in the application of slinging techniques, selection and inspection of lifting gear and/or the directing of the crane/ operator in the movement of the load.

This unit is based upon the National Standard for Licensing Persons Performing High Risk Work.

This unit in its current form meets state and territory licensing requirements. Any alteration will result in a unit which is not acceptable to regulators for the purpose of licensing.

Licensing/Regulatory Information

Refer to Unit Descriptor

Pre-Requisites

Prerequisite units Nil

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Employability Skills Information

Employability skills This unit contains employability skills.

Elements and Performance Criteria Pre-Content

Elements describe the essential outcomes of a unit of competency.	Performance criteria describe the performance needed to demonstrate achievement of the element. Where bold italicised text is used, further information is detailed in the required skills and knowledge section and the range statement. Assessment of performance is to be consistent with the evidence guide.

Elements and Performance Criteria

ELEMENT	PERFORMANCE CRITERIA
1. Plan job.	1.1. ***Site information*** is obtained and related to the task. 1.2. ***Hazard*** s and potential hazards associated with the slinging and directing of loads are identified. 1.3. ***Hazard control measures*** consistent with ***appropriate standards*** are identified to ensure the safety of personnel and equipment. 1.4. The weight, dimensions and centre of gravity of the load are identified and assessed. 1.5. Suitable lifting/slinging points on the load are identified. 1.6. Appropriate ***lifting equipment*** needs are assessed. 1.7. Appropriate ***communication methods*** are assessed with ***crane***/ operators and other ***appropriate personnel***. 1.8. Manufacturer's specifications/information is obtained for special loads where necessary.
2. Select and inspect equipment.	2.1. Lifting equipment appropriate to the task is selected. 2.2. Lifting equipment is inspected for serviceability. 2.3. Damaged or excessively worn lifting equipment is identified, labelled and rejected.

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ELEMENT	PERFORMANCE CRITERIA
	2.4. Appropriate communication methods for the crane/operator and appropriate personnel are selected. 2.5. Appropriate ***communication equipment*** is selected and its serviceability is checked. 2.6. Appropriate ***personal protective equipment*** (PPE) is selected and checked.
3. Prepare site and equipment.	3.1. Hazard prevention/control measures are applied consistent with appropriate standards to ensure the safety of personnel and equipment. 3.2. Appropriate slinging method is selected. 3.3. Lifting equipment is prepared and assembled where appropriate. 3.4. Load destination is prepared.
4. Perform task.	4.1. Lifting equipment is attached and secured to the lifting hook using appropriate techniques. 4.2. Lifting hook is positioned over the load centre of gravity. 4.3. Lifting equipment is attached and secured to the load in an appropriate manner. 4.4. Tag line is attached and secured where appropriate. 4.5. Test lift is conducted to ensure security of load. 4.6. Load is moved maintaining stability and control at all times. 4.7. Appropriate communication methods and ***communication signals*** are applied to safely coordinate the load movement both within sight and out-of-sight of crane operator. 4.8. The load is landed to ensure that it is stable and secure from movement. 4.9. Lifting equipment is removed or disconnected from load and prepared for next task or storage.
5. Shut down job and clean up.	5.1. Unserviceable lifting equipment inspected and rejected. 5.2. ***Defective equipment*** is isolated and tagged. 5.3. Lifting equipment is stored in accordance with procedures and appropriate standards. 5.4. Hazard prevention/control measures are removed where appropriate. 5.5. Excess materials from the work area are removed (where applicable).

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ELEMENT	PERFORMANCE CRITERIA
	5.6. Defects are reported and recorded according to procedures and appropriate action is taken.

Required Skills and Knowledge

REQUIRED SKILLS AND KNOWLEDGE

This section describes the skills and knowledge required for this unit.

Required skills

Required skills for this unit are:

- communication techniques in the workplace including whistles, hand signals and use of fixed channel two-way radios
- communication skills at a level sufficient to communicate with other site personnel
- calculate rated capacity of lifting equipment
- apply different methods for making temporary connections to loads using fibre and synthetic ropes
- ability to interpret rated capacity and working load limit tags
- hazard identification and control
- slinging techniques
- selection and inspection of lifting equipment
- directing crane operators in the moving of loads in a safe manner, using a slewing crane
- inspection and care of a wide range of lifting equipment to appropriate Australian Standards and/or manufacturer's specifications.

Required knowledge

Required knowledge for this unit is:

- appropriate mathematical procedures for estimation and measurement of loads
- basic knowledge of types of cranes and their functions
- Commonwealth, state or territory OHS legislation, standards and codes of practice relevant to the full range of techniques for undertaking dogging activities
- load stability and safety factors in line with manufacturer's specifications
- types of lifting equipment and slinging techniques for use, and their limitations and performance in a wide range of conditions (including but not limited to slings, beams, accessories, clamps, work-boxes, bins and pallets)
- understanding of the hierarchy of control.

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Evidence Guide

EVIDENCE GUIDE

The evidence guide provides advice on assessment and must be read in conjunction with the performance criteria, required skills and knowledge, range statement and the Assessment Guidelines for the Training Package.

Overview of assessment

Successful assessment of this unit meets the competency requirement of the National Standard for licensing Persons Performing High Risk Work.

State/Territory OHS regulators have mandated the use of Assessment Instruments and Instructions for Assessment of this unit which have been endorsed by the national body responsible for OHS matters.

Critical aspects for assessment and evidence required to demonstrate competency in this unit

A person who demonstrates competency in this unit must be able to provide evidence of the ability to:

- comply with Commonwealth, state or territory OHS legislation, standards relevant to safe dogging and crane operations.
- communicate and work safely with others in the work area.
- apply Hazard prevention and control measures consistent with appropriate standards.
- apply to move loads in conjunction with cranes including, the reading of tags, slinging, loading, directing and landing loads with a slewing mobile crane with a telescopic boom and a winch, in and out of sight of the crane/ operator, moving four loads of varying shapes, sizes and weights.
- use fibre and/or synthetic rope as tag lines, and connecting to loads using clove hitch, rolling hitch, bowline and single sheetbend.
- conduct pre and post operational checks of the lifting equipment.

Context of and specific resources for assessment

- Assessment of the safe and effective application of knowledge and skill to workplace tasks (performance) must be undertaken using the national OHS endorsed Assessment Instrument
- Assessment of performance must be

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EVIDENCE GUIDE

	undertaken either in the workplace or in a realistically simulated workplace setting
	• Assessors must ensure that the assessment in the workplace is organised through a workplace supervisor to ensure that all the required equipment and materials and a suitable working area is made available to suit the assessment and the workplace
	• Assessment must occur under standard and authorised work practices, safety requirements and environmental constraints
	• Assessment is to comply with the requirements of any relevant Standards or operating procedures for dogging activities
	• Applicants must have access to:
	  • personal protective equipment (PPE) for the purpose of the performance assessment.
	  • four different loads as prescribed in the endorsed assessment instrument
	  • lifting and associated equipment
	  • suitable slewing crane
	  • communication equipment (eg. fixed channel, two-way radios) as applicable.

Method of assessment	Assessment must be conducted using the national OHS endorsed Assessment Instrument. This Instrument provides instruction on the application of the assessment. Assessment may be in conjunction with the assessment of other units of competency. The use of **'simulators'** in the assessment of this unit of competency is **not acceptable**. Assessment methods must confirm consistency and accuracy of performance together with application of underpinning knowledge. Assessment must confirm a reasonable inference that competency is not only able to be satisfied under the particular circumstance, but is able to be transferred to other circumstances.
Guidance information for assessment	Further information about endorsed Assessment Instruments may be obtained from state/territory OHS regulators.

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Range Statement

RANGE STATEMENT

The range statement relates to the unit of competency as a whole. It allows for different work environments and situations that may affect performance. Bold italicised wording, if used in the performance criteria, is detailed below. Essential operating conditions that may be present with training and assessment (depending on the work situation, needs of the candidate, accessibility of the item, and local industry and regional contexts) may also be included.

Site informationmay include but not be limited to	• local conditions such as access and egress • work method statements.
Hazards may include but not limited to:	• ground stability (eg. ground condition, recently filled trenches, slopes) • overhead hazards (e.g. power lines, service pipes, trees, buildings, etc) • insufficient lighting • traffic (e.g. pedestrians, vehicles, plant) • weather (e.g. wind, lightning, storms) • other specific hazards (e.g. trip hazards, heights, radio interference, etc).
Hazard prevention/control measures	The systematic process of eliminating or reducing the risk to personnel and property through the application of controls. It includes the application of the hierarchy of controls, including: 1. elimination. 2. substitution. 3. isolation. 4. engineered control measures. 5. safe work practices. 6. personal protective equipment.
Appropriate standard s may include:	• codes of practice • legislation • Australian Standards • manufacturer's specifications • industry standards.

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RANGE STATEMENT

Lifting Equipment may include but not limited to:	• fibre ropes • wire ropes • chain • wire and synthetic slings • shackles • eyebolts • beam clamps • plate clamps • spreader beams • lifting beams • pallet forks and cages • concrete kibbles • personnel boxes.
Communication Methods may include but are not limited to:	• written instructions • signage, • hand signals • listening • questioning to confirm understanding • appropriate worksite protocol.
Cranes may include but not limited to:	• tower cranes (including self erecting) • portal boom cranes • vehicle loading cranes • slewing mobile cranes • non-slewing cranes • derrick cranes.
Appropriate personnel may include but are not limited to:	• supervisors • colleagues • managers who are authorised to take responsibility for the workplace or operations.
Communication Equipment may include but not limited to:	• fixed channel two-way radios • whistles • bells.
Personal protective equipment (PPE) may include but not limited to:	• hard hat • safety boots • gloves • high visibility clothing • reflective vest • relevant breathing, hearing, sight, skin and sun protection.
Load destination may include but	• ground

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RANGE STATEMENT

not limited to:	• loading platforms • suspended floors • vehicles.
Communication signals may include but not limited to:	• stop - hand • stop - whistle • hoist up - hand • hoist up - whistle • hoist down - hand • hoist down - whistle • luff boom down - hand • luff boom down - whistle • luff boom up - hand • luff boom up - whistle • telescope out - hand • telescope out - whistle • telescope in - hand • telescope in - whistle • slew left - hand • slew left - whistle • slew right - hand • slew right - whistle.
Defective Equipment may include but not limited to:	• excessive wear • damage • stretched • broken wires • cut/damaged fibres.

Unit Sector(s)

Unit sector Construction

Co-requisite units

Co-requisite units Nil

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Co-requisite units Nil

Functional area

Functional area

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CPCCLHS3001A Licence to operate a personnel and materials hoist

Modification History

Not Applicable

Unit Descriptor

Unit descriptor This unit specifies the outcomes required to operate a builder's hoist in which personnel, goods and/or materials may be hoisted, and which comprises a car, structure, machinery or other equipment associated with the hoist, and which may be a cantilever hoist, a tower hoist or a multiple winch operation. Included in this definition are situations where winches may be configured to operate as hoists for the transportation of personnel for licensing purposes.

Application of the Unit

Application of the unit

This unit requires the operator to plan work, conduct routine checks, conduct hoist operations and shut down and secure a hoist.

This unit is based on the requirements of the National Standard for Licensing Persons Performing High Risk Work.

This unit in its current form meets state and territory licensing requirements. Any alteration will result in a unit, which is not acceptable to regulators for the purpose of licensing.

Licensing/Regulatory Information

Refer to Unit Descriptor

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Pre-Requisites

Prerequisite units Nil

Employability Skills Information

Employability skills This unit contains employability skills.

Elements and Performance Criteria Pre-Content

Elements describe the essential outcomes of a unit of competency.	Performance criteria describe the performance needed to demonstrate achievement of the element. Where bold italicised text is used, further information is detailed in the required skills and knowledge section and the range statement. Assessment of performance is to be consistent with the evidence guide.

Elements and Performance Criteria

ELEMENT	PERFORMANCE CRITERIA
1. Plan work.	1.1. Potential workplace ***hazards*** are identified. 1.2. ***Hazard prevention***/***control measures*** are identified consistent with ***appropriate standards*** to ensure the safety of personnel and equipment. 1.3. The ***hoist*** is appropriate to the load/s and workplace conditions. 1.4. The weight of the load is determined according to ***procedures***. 1.5. Appropriate communication methods are identified with appropriate personnel.
2. Conduct routine checks.	2.1. Hoist is visually checked for any damage or detects. 2.2. Appropriate hazard prevention/control measures are applied to the work area according to procedures and potential hazards.

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ELEMENT	PERFORMANCE CRITERIA
	2.3. ***Service logbook*** for the hoist is checked for compliance. 2.4. ***Routine pre-start operational checks*** are carried out according to procedures. 2.5. Main power supply is switched on. 2.6. Hoist is started according to procedures and checks made for any abnormal noises. 2.7. All controls located and checked for serviceability. 2.8. Post start operational checks are carried out according to procedures. 2.9. All ***communication equipment***, lighting and alarm systems are checked for serviceability. 2.10. All hoist ***safety devices*** are tested to their maximum according to procedures. 2.11. All damage and defects are reported and recorded according to procedures and appropriate action taken.
3. Conduct hoist operations.	3.1. Hoist is operated according to procedures. 3.2. Communication methods associated with hoist movements are conducted according to procedures and the appropriate standards. 3.3. Loads and load distribution are continually monitored to ensure that the hoist is operated within its capacity according to procedures. 3.4. Hoist movement is monitored constantly ensuring safety to appropriate personnel and hoist stability. 3.5. ***Unplanned and/or unsafe situations*** are responded to in line with procedures.
4. Shut down and secure hoist.	4.1. Hoist is ***shut down*** according to procedures. 4.2. All fences and gates are secured according to procedures. 4.3. Routine post -operational checks are carried out according to procedures. 4.4. Power is isolated and secured against unauthorised access. 4.5. All damage and defects are reported and recorded according to procedures and appropriate action taken.

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Required Skills and Knowledge

REQUIRED SKILLS AND KNOWLEDGE

This section describes the skills and knowledge required for this unit.

Required skills

Required skills for this unit are:

- accurately record and maintain information relating to personnel and materials hoist operations
- communication techniques in the workplace including bells, lights, intercom and use of two-way radios
- conduct personnel and materials hoist operations
- operate emergency brake and decent system
- hazards associated with the operation of the personnel and materials hoist are identified, risks are assessed and effective hazard prevention/control measures for those hazards identified and put into place
- inspect personnel and materials hoist equipment, safety equipment and installation for safe operation including general maintenance
- communication skills at a level sufficient to communicate with other site personnel (e.g. receive and interpret work instructions, safety information, emergency procedures)
- verify problems and equipment faults and demonstrate appropriate response.

Required knowledge

Required knowledge for this unit is:

- weight of the load is determined from labels, markings or load paperwork
- level of literacy to be able to read and comprehend manufacturer's instructions, procedures and safety signs
- Commonwealth, state or territory OHS legislation, standards and codes of practice relevant to the full range of processes for the hoist class
- hoist operations and operating techniques
- understanding of the hierarchy of hazard identification and control
- materials safety data sheets and requirements for safe movement of materials
- organisational and workplace standards, requirements, policies and procedures for conducting operations for the hoist class
- procedures for the recording, reporting and maintenance of workplace records and information
- rated capacity and working load limits
- typical routine problems encountered in the operation of a personnel and materials hoist, inspection techniques and adjustments required for correction.

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Evidence Guide

EVIDENCE GUIDE

The evidence guide provides advice on assessment and must be read in conjunction with the performance criteria, required skills and knowledge, range statement and the Assessment Guidelines for the Training Package.

Overview of assessment	Successful assessment of this unit meets the competency requirement of the National Standard for licensing Persons Performing High Risk Work. State/territory OHS regulators have mandated the use of Assessment Instruments and Instructions for Assessment for this unit which have been endorsed by the national body responsible for OHS matters.
Critical aspects for assessment and evidence required to demonstrate competency in this unit	A person who demonstrates competency in this unit must be able to provide evidence of the ability to: • comply with OHS licensing legislation • effectively communicate and work safely with others in the work area • identify hazards associated with the operation of the hoist and put in place effective hazard controls for those hazards identified • determine load weights • effectively conduct personnel and materials hoist operations to include the tasks of raising and lowering loads with hoist; in conjunction with awareness of the limitations of the hoist according to manufacturer's specifications • ensure hoist controls are attended throughout operation. • effectively conduct emergency lowering of the hoist according to the emergency lowering procedure • effectively conduct pre operational and shut down checks of the personnel and materials hoist (particular awareness of controls, alarms and lockout devices).
Context of and specific resources for assessment	• Assessment of the safe and effective application of knowledge and skill to workplace tasks (performance) must be undertaken using the endorsed Assessment Instrument

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	• Assessment of performance must be undertaken either in the workplace or in a realistically simulated workplace
	• Assessors must ensure that the assessment in the workplace is organised to ensure that all the required equipment and materials and a suitable working area is made available to suit the assessment and the workplace
	• Assessment must occur under standard and authorised work practices, safety requirements and environmental constraints
	• Assessment is to comply with relevant appropriate standard requirements
	• Applicants must have access to:
	  • personal protective equipment (PPE) for the purpose of the Performance Assessment.
	  • appropriate personnel and material hoist and associated equipment in safe condition
	  • suitable loads as specified by the endorsed assessment instrument
	  • communication equipment (e.g. two-way radios, intercoms, light systems, buzzers, bells etc)

Method of assessment	Assessment must be conducted using the endorsed Assessment Instruments. These Instruments provide advice on their application. The use of **'simulators'** in the assessment of this unit of competency is **not acceptable**. Assessment may be in conjunction with the assessment of other units of competency. Assessment methods must confirm consistency and accuracy of performance together with application of underpinning knowledge. Assessment must confirm a reasonable inference that competency is not only able to be satisfied under the particular circumstance, but is able to be transferred to other circumstances.
Guidance information for assessment	Further information about endorsed Assessment Instruments may be obtained from state/territory OHS regulators.

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Range Statement

RANGE STATEMENT

The range statement relates to the unit of competency as a whole. It allows for different work environments and situations that may affect performance. Bold italicised wording, if used in the performance criteria, is detailed below. Essential operating conditions that may be present with training and assessment (depending on the work situation, needs of the candidate, accessibility of the item, and local industry and regional contexts) may also be included.

Hazards may include but are not limited to:	• ground conditions (e.g. condition of pavement, slopes) • overhead hazards (e.g. power lines, service pipes) • traffic (e.g. pedestrians, vehicles, other plant) • environmental conditions (e.g. wind, lightning, rain) • hoist overload • other specific hazards (e.g. dangerous materials).
Hazard prevention/control measures may include:	Refers to the systematic process of eliminating or reducing the risk to personnel and property through the application of controls. It includes application of the hierarchy of control, the six step preference of control measures to manage and control risk: • elimination • substitution • isolation • engineering control measures • using safe work practices • personal protective equipment
Appropriate standards may include:	• codes of practice • legislation • Australian standards • manufacturer specifications.
Hoist includes:	• the operation of a builder's hoist in which personnel, goods and/or materials may be hoisted, and which comprises a car, structure, machinery or other equipment associated with the hoist, and which may be a cantilever hoist, a tower hoist or a multiple winch operation.

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RANGE STATEMENT

	Included in this definition are situations where winches may be configured to operate as hoists for the transportation of personnel.
Procedures may include but not limited to:	• manufacturer's guidelines (instructions, specifications or checklists) • industry operating procedures • workplace procedures (work instructions, operating procedures, checklists).
Communication methods may include but not limited to:	• verbal and non-verbal language • written instructions • signage • hand signals • listening • questioning to confirm understanding • appropriate worksite protocol • interfloor/level communications
Appropriate personnel may include but not limited to:	• those associated with the operations of the personnel and materials hoist • supervisors • colleagues • managers who are authorised to take responsibility for the workplace or operations.
Service logbook may include but is not limited to:	• any logbook • service book • history record system where the service and maintenance history is kept.
Routine pre start operational checks may include but not limited to:	• ground stability • tower ties/guys are secure • power supply is covered by earth leakage protection • power leads secured above ground level and not attached to scaffolds or building structure • tower guides are clean and free of rust and damage • signs are clearly displayed and legible • brakes and drive mechanism • overhead protection • intercom and signalling systems • barriers, fencing and gates • fuels, oil and water • lubrication (grease)

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RANGE STATEMENT

	• hoist rope • sheaves and anchorage points.
Communication equipment may include but not limited to:	• fix frequency two-way radios • bells • buzzers • lights. **NB**: where radio communication equipment is used the transmitting frequencies of the equipment must be selected to prevent interference to or from other radio equipment being used in the vicinity of the hoist.
Safety devices may include but not limited to:	• emergency braking system • overrun limits • gate interlocks • personnel access interlock on hoist roof.
Appropriate standards may include but are not limited to:	• codes of practice • legislation • Australian Standards • manufacturer's specifications • industry standards (where applicable).
Unplanned and/or unsafe situations may include but not limited to:	• failure/loss of control e.g. power supply, braking system • failure of equipment e.g. hydraulic system, broken hoist cable, damaged gear drive • environmental conditions e.g. wind, lightning, storms.
Shut down may include but not limited to:	• platform positioned at base of tower • lock on manual safety brake • landing gates secured to prevent unauthorised access • power isolated from control panel • mains power supply isolated and secured • internal combustion engine idled to stabilise temperature • engine turned off • fencing/barriers around base secured to prevent unauthorised access • key removed (where applicable).

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Unit Sector(s)

Unit sector Construction

Co-requisite units

Co-requisite units Nil

Functional area

Functional area

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CPCCLHS3002A Licence to operate a materials hoist

Modification History

Not Applicable

Unit Descriptor

Unit descriptor This unit specifies the outcomes required to operate a materials hoist being a builder's hoist by which only goods or materials and not personnel may be hoisted and where the car, bucket or platform is cantilevered from, and travels up and down externally to, a face of the support structure for licensing purposes.

Application of the Unit

Application of the unit

This unit requires the operator to plan work, conduct routine checks, check controls and operation, conduct hoist operation and shut down and secure hoist.

This unit is based on the requirements of the National Standard for Licensing Persons Performing High Risk Work.

This unit in its current form meets state and territory licensing requirements. Any alteration will result in a unit which is not acceptable to regulators for the purpose of licensing.

Licensing/Regulatory Information

Refer to Unit Descriptor

Pre-Requisites

Prerequisite units Nil

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Prerequisite units Nil

Employability Skills Information

Employability skills This unit contains employability skills.

Elements and Performance Criteria Pre-Content

Elements describe the essential outcomes of a unit of competency.	Performance criteria describe the performance needed to demonstrate achievement of the element. Where bold italicised text is used, further information is detailed in the required skills and knowledge section and the range statement. Assessment of performance is to be consistent with the evidence guide.

Elements and Performance Criteria

ELEMENT	PERFORMANCE CRITERIA
1. Plan work.	1.1. Potential workplace ***hazards*** are identified. 1.2. ***Hazard control measures*** are identified consistent with ***appropriate standards*** to ensure the safety of personnel and equipment. 1.3. The ***hoist*** is appropriate to the load/s and workplace conditions. 1.4. The weight of the load is determined according to ***procedures***. 1.5. Appropriate communication methods are identified with appropriate personnel.
2. Conduct routine checks.	2.1. Hoist is visually checked for any damage or detects 2.2. Appropriate ***hazard prevention***/***control measures*** are applied to the work area according to ***procedures***. 2.3. ***Service logbook*** for the hoist is checked for compliance

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ELEMENT	PERFORMANCE CRITERIA
	2.4. ***Routine pre-start operational checks*** are carried out according to procedures. 2.5. Main power supply is switched on. 2.6. Hoist is started according to procedures and checked for any abnormal noises. 2.7. All controls located and checked for serviceability. 2.8. Post start operational checks are carried out according to procedures. 2.9. All ***communication equipment***, lighting and alarm systems are checked for serviceability. 2.10. All hoist ***safety devices*** and functions are tested to their maximum according to procedures. 2.11. All damage and defects are reported and recorded according to procedures and appropriate action taken.
3. Conduct hoist operations.	3.1. Hoist is operated according to procedures. 3.2. Communication methods associated with hoist movement are conducted according to procedures and the appropriate standard. 3.3. Loads and Load distribution are continually monitored to ensure that the hoist is operated within its capacity and according to procedures. 3.4. Hoist movement is monitored constantly ensuring safety to personnel and stability. 3.5. ***Unplanned and/or unsafe*** situations are responded to in line with procedures.
4. Shut down and secure hoist.	4.1. Hoist is ***shut down***, according to procedures. 4.2. All fences and gates are secured according to procedures. 4.3. Routine post -operational checks are carried out according to procedures. 4.4. Power is isolated and secured against unauthorised access. 4.5. All damage and defects are reported and recorded. according to procedures and appropriate action taken.

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Required Skills and Knowledge

REQUIRED SKILLS AND KNOWLEDGE

This section describes the skills and knowledge required for this unit.

Required skills

Required skills for this unit are:

- accurately record and maintain information relating to materials hoist operations
- communication techniques in the workplace including bells, lights, hand signals intercom and use of two-way radios
- conduct materials hoist operations
- hazards associated with the operation of the materials hoist are identified, risks are assessed and effective hazard prevention/control measures for those hazards identified and put into place
- inspect materials hoist equipment, safety equipment and installation for safe operation
- interpersonal communication skills at a level sufficient to communicate with other site personnel (e.g. receive and interpret work instructions, safety information, emergency procedures)
- verify problems and equipment faults and demonstrate appropriate response procedures.

Required knowledge

Required knowledge for this unit is:

- weight of the load is determined from labels, markings or load paperwork
- level of literacy to be able to read and comprehend manufacturer's instructions, procedures and safety signs
- Commonwealth, state or territory OHS legislation, standards and codes of practice relevant to the full range of processes for the hoist class
- hoist operations and operating techniques
- understanding of the hierarchy of hazard identification and control
- materials safety data sheets and requirements for safe movement of materials
- organisational and workplace standards, requirements, policies and procedures for conducting operations for the hoist class
- procedures for the recording, reporting and maintenance of workplace records and information
- rated capacity and working load limits
- typical routine problems encountered in the operation of a materials hoist, inspection techniques and adjustments required for correction.

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Evidence Guide

EVIDENCE GUIDE

The evidence guide provides advice on assessment and must be read in conjunction with the performance criteria, required skills and knowledge, range statement and the Assessment Guidelines for the Training Package.

Overview of assessment	Successful assessment of this unit meets the competency requirement of the National Standard for licensing Persons Performing High Risk Work. State/Territory OHS regulators have mandated the use of Assessment Instruments and Instructions for Assessment for this unit which have been endorsed by the national body responsible for OHS matters.
Critical aspects for assessment and evidence required to demonstrate competency in this unit	A person who demonstrates competency in this unit must be able to provide evidence of the ability to: • comply with OHS licensing legislation. • effectively communicate and work safely with others in the work area. • identify hazards associated with the operation of the hoist and put in place effective hazard prevention/controls • determine load weights. • effectively conduct materials hoist operations to include the tasks of raising and lowering loads with equipment and materials for cantilevered cars, buckets or platforms. • ensure the hoist is attended at all times. • effectively conduct pre operational and shut down checks of the materials hoist (particular awareness of controls, alarms and lockout devices).
Context of and specific resources for assessment	• Assessment of the safe and effective application of knowledge and skill to workplace tasks (performance) must be undertaken using the endorsed Assessment Instrument • Assessment of performance must be undertaken either in the workplace or in a realistically simulated workplace setting • Assessors must ensure that the assessment in the workplace is organised to ensure that all the required equipment and materials and a

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	suitable working area is made available to suit the assessment and the workplace
	• Assessment must occur under standard and authorised work practices, safety requirements and environmental constraints
	• Assessment is to comply with relevant appropriate standard requirements
	• Applicants must have access to:
	  • personal protective equipment (PPE) for the purpose of the Performance Assessment.
	  • appropriate material hoist and equipment in safe condition
	  • suitable loads as specified by the endorsed assessment instrument
	  • communication equipment (e.g. two-way radios, intercoms, light systems buzzers or bells etc)

Method of assessment	Assessment must be conducted using the endorsed Assessment Instruments. These Instruments provide advice on their application. The use of **'simulators'** in the assessment of this unit of competency is **not acceptable**. Assessment may be in conjunction with the assessment of other units of competency. Assessment methods must confirm consistency and accuracy of performance together with application of underpinning knowledge. Assessment must confirm a reasonable inference that competency is not only able to be satisfied under the particular circumstance, but is able to be transferred to other circumstances.
Guidance information for assessment	Further information about endorsed Assessment Instruments may be obtained from state/territory OHS regulators.

Range Statement

RANGE STATEMENT

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RANGE STATEMENT

The range statement relates to the unit of competency as a whole. It allows for different work environments and situations that may affect performance. Bold italicised wording, if used in the performance criteria, is detailed below. Essential operating conditions that may be present with training and assessment (depending on the work situation, needs of the candidate, accessibility of the item, and local industry and regional contexts) may also be included.

Hazards may include but not limited to:	• ground conditions (e.g. condition of pavement, slopes) • overhead hazards (e.g. power lines, service pipes) • Insufficient lighting • traffic (e.g. pedestrians, vehicles, other plant) • environmental conditions (e.g. wind, lightning, rain) • hoist overload • other specific hazards (e.g. dangerous materials).
Hazard control measures:	Refers to the systematic process of eliminating or reducing the risk to personnel and property through the application of controls. It includes the application of the hierarchy of control, the six-step preference of control measures to manage and control risk: • elimination • substitution • isolation • engineering control measures • using safe work practices • personal protective equipment.
Appropriate standards may include but not limited to:	• codes of practice • legislation • Australian Standards • manufacturer's specifications • industry standard (where applicable).
Hoist may include:	the operation of builder's hoist by which only goods or materials and not personnel may be hoisted and where the car, bucket or platform is cantilevered from, and travels up and down externally to, a face of the support structure.
Procedures may include but are	• manufacturer's guidelines (instructions,

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not limited to:	specifications or checklists) • industry operating procedures • workplace procedures (work instructions, operating procedures, checklists).
Communication methods may include but are not limited to:	• verbal and non-verbal language • written instructions • signage • hand signals • listening • questioning to confirm understanding • appropriate worksite protocol • interfloor/ level communications.
Appropriate personnel may include but are not limited to:	• those associated with the operations of the hoist • supervisors • colleagues • managers who are authorised to take responsibility for the workplace or operations.
Hazard prevention/control measures may include but not limited to:	• safety tags on electrical switches/isolators • traffic barricades and control • pedestrian barricades • movement of obstructions • personal protective equipment • hoist safety gates and guards • hoist safety interlocks • adequate illumination.
Service logbook may include but is not limited to:	• any logbook • service book • history record system where the service and maintenance history is kept.
Routine pre start operational checks may include but are not limited to:	• check ground stability • tower ties/guys are secure • power supply is covered by earth leakage protection • power leads are secured above ground level and not attached to scaffolds or building structure • tower guides are clean and free of rust and damage • signage is clearly displayed and legible • brakes and drive mechanism

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	• overhead protection • intercom and signalling systems • barriers, fencing and gates • fuels, oil and water (where applicable) • lubrication (grease) • hoist rope • sheaves and anchorage points.
Communication equipment may include but is not limited to:	• fixed channel two-way radios • intercoms • bells • lights • buzzers. **NB**: where radio communication equipment is used the transmitting frequencies of the equipment must be selected to prevent interference to or from other radio equipment being used in the vicinity of the hoist.
Safety devices may include but not limited to:	• emergency braking system • overrun limits • gate interlocks.
Unplanned and/or unsafe situations may include but are not limited to:	• failure/lose of control e.g. power supply, braking system • failure of equipment e.g. hydraulic system, broken hoist cable, damaged drive gear • environmental conditions (e.g. wind, lightning, storms, etc).
Shut Down may include but not limited to:	• position platform at base of tower • power isolated from control panel • mains power supply isolated and secured • fencing/barriers around base secured to prevent unauthorised access • landing gates secured to prevent unauthorised access • key removed from control panel (where applicable).

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Unit Sector(s)

Unit sector Construction

Co-requisite units

Co-requisite units Nil

Functional area

Functional area

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CPCCLRG3001A Licence to perform rigging basic level

Modification History

Not Applicable

Unit Descriptor

Unit descriptor

This unit specifies the outcomes required to perform basic rigging work associated with movement of plant and equipment, steel erections, hoists (including mast climbing hoists), placement of pre-cast concrete, safety nets and static lines, perimeter safety screens and shutters; and cantilever crane loading platforms for licensing purposes.

Application of the Unit

Application of the unit

This unit requires the applicant to be able plan the work, select and inspect equipment, set up task, erect structures and plant and dismantle structures and plant.

This unit is based upon the National Standard for Licensing Persons Performing High Risk Work.

This unit in its current form meets state and territory licensing requirements. Any alteration will result in a unit which is not acceptable to regulators for the purpose of licensing.

This unit has a pre-requisite requirement. This requirement may be met by either the successful completion of the unit *CPCCLDG3001A Licence to perform dogging* or holding a valid licence for dogging.

Licensing/Regulatory Information

Refer to Unit Descriptor

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Pre-Requisites

Prerequisite units

CPCCLDG3001A	Licence to perform dogging

Employability Skills Information

Employability skills This unit contains employability skills.

Elements and Performance Criteria Pre-Content

Elements describe the essential outcomes of a unit of competency.	Performance criteria describe the performance needed to demonstrate achievement of the element. Where bold italicised text is used, further information is detailed in the required skills and knowledge section and the range statement. Assessment of performance is to be consistent with the evidence guide.

Elements and Performance Criteria

ELEMENT	PERFORMANCE CRITERIA
1. Plan job.	1.1. Task to be undertaken is assessed. 1.2. Potential workplace ***hazards*** are identified. 1.3. ***Hazard control measures*** are identified consistent with ***appropriate standards*** to ensure the safety of personnel and equipment. 1.4. Site information is obtained. 1.5. All ***forces and loads*** associated with erecting and dismantling ***structures*** and ***associated plant*** are considered in consultation with ***appropriate personnel***. 1.6. ***Rigging equipment*** and ***associated equipment*** are identified in consultation with appropriate personnel according to ***procedures*** and site information.

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ELEMENT	PERFORMANCE CRITERIA
	1.7. *Safety equipment* is identified.
	1.8. Appropriate ***communication methods*** are identified with appropriate personnel.
2. Select and inspect equipment.	2.1. Rigging equipment and associated equipment are selected and inspected according to procedures and the appropriate standard.
	2.2. Safety equipment is selected and inspected according to procedures.
	2.3. All defective rigging equipment, associated equipment and safety equipment is isolated, reported and recorded according to procedures.
	2.4. ***Communication equipment*** is selected and inspected for serviceability (where applicable.
3. Set up task.	3.1. Appropriate ***hazard prevention***/***control measures*** are applied to the work area according to procedures.
	3.2. ***Ground suitability*** is inspected and checked (where appropriate).
	3.3. Site information is reviewed, interpreted and communicated to appropriate personnel and ***appropriate personnel***.
	3.4. All forces and loads associated with erecting and dismantling structures and associated plant are determined in consultation with appropriate personnel.
	3.5. Safety equipment is fitted and worn correctly (where appropriate).
	3.6. Rigging equipment and associated plant are positioned for work application and stability according to procedures.
	3.7. Methods of applying ***temporary connections*** using fibre rope are applied according to procedures and the appropriate standard.
4. Erect structures and plant.	4.1. Structures and associated plant are erected according to procedures and site information.
	4.2. Stability of structures and associated plant is maintained during erection according to procedures.
	4.3. Work is conducted safely at heights including safe and effective use of safety equipment.
	4.4. Appropriate communication methods and communication equipment, are used to co-ordinate the tasks.
	4.5. Associated plant and rigging equipment is used

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ELEMENT	PERFORMANCE CRITERIA
	according to procedures and the appropriate standard. 4.6. Temporary guys, ties, propping and shoring, including ***flexible steel wire rope***, and tubing, are connected where required. 4.7. Associated equipment is used in a safe and appropriate manner. 4.8. The completed task is inspected according to the appropriate standard. 4.9. Excess materials are removed from the work area (where applicable).
5. Dismantle structures and plant.	5.1. Structures and associated plant are dismantled according to procedures and the appropriate standard. 5.2. Work is conducted safely at heights including safe and effective use of safety equipment. 5.3. Stability of structures and associated plant is maintained during dismantling according to procedures. 5.4. Rigging equipment, associated equipment, safety equipment and associated plant are inspected for damage and defects. 5.5. All defective rigging equipment, associated equipment, associated plant and safety equipment are isolated reported and recorded according to procedures. 5.6. Rigging equipment and associated equipment are stored. according to procedures and the appropriate standard. 5.7. Hazard prevention/control measures are removed (where appropriate).

Required Skills and Knowledge

REQUIRED SKILLS AND KNOWLEDGE

This section describes the skills and knowledge required for this unit.

Required skills

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REQUIRED SKILLS AND KNOWLEDGE

Required skills for this unit are:

- ability to calculate Safe Working Load (SWL) and Working Load Limit (WLL)
- ability to erect and dismantle, level, plumb and stabilise associated plant and structures
- ability to work safely at heights including the correct application of safety equipment.
- accurate interpretation of basic structural charts and structural plans (site information)
- applying methods for making temporary connections of ropes using fibre and synthetic types
- apply methods of splicing and whipping fibre and synthetic ropes
- correct application and use of all rigging and associated equipment
- risk assessment and hazard control strategies
- interpersonal and communication skills at a level sufficient to site/workplace requirements. This includes the relevant communication methods and equipment.
- verify problems and equipment faults and demonstrate appropriate response.

Required knowledge

Required knowledge for this unit is:

- appropriate mathematical procedures for estimation and measurement of loads
- ability to interpret manufacturer's specifications for all plant and equipment use in rigging operations
- knowledge of principles relating to all plant, equipment and structural stability
- knowledge of the types and functions of rigging, safety and associated equipment including an understanding of their limitations.
- organisational and workplace standards, requirements, policies and procedures for rigging
- understanding of the hierarchy of hazard identification and control
- relevant Commonwealth, state or territory and local government OHS legislation, standards and codes of practice for undertaking rigging activities
- understanding of inspection and maintenance requirements of a wide range of appropriate plant and equipment in line with Australian Standards or manufacturer's specifications
- estimation of ground bearing pressures of the full range of soil types and associated ground conditions for setting up plant and equipment.

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Evidence Guide

EVIDENCE GUIDE

The evidence guide provides advice on assessment and must be read in conjunction with the performance criteria, required skills and knowledge, range statement and the Assessment Guidelines for the Training Package.

Overview of assessment

Successful assessment of this unit meets the competency requirement of the National Standard for licensing Persons Performing High Risk Work.

State/Territory OHS regulators have mandated the use of Assessment Instruments and Instructions for Assessment endorsed by the national body responsible for OHS matters for the assessment of this unit.

Critical aspects for assessment and evidence required to demonstrate competency in this unit

A person who demonstrates competency in this unit must be able to provide evidence of the ability to:

- comply with OHS licensing legislation.
- effectively communicate and work safely with others in the work area.
- effectively conduct risk assessment and management procedures.
- effectively complete the following tasks:-
  - inspection of all plant and equipment, and
  - installation of a fall arrest system (Static line), and
  - use of a safety harness / fall arrest system, and
  - installation of crane loading platforms and
  - installation of a safety net, and
  - installation of a shutter and safety screen, and
  - demonstrated ability to work safely at heights, and
  - erection of structural steel, and
  - erection of precast panel, and
  - set up and operation of a winch for load movement, and
  - installation of a materials hoist, or
  - installation of a mast climber.
- effectively demonstrate the following knots,

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	bends and hitches:- • Sheet bend, • Becket hitch, • Running bowline, • Double bowline. • effectively demonstrate the following splices and whippings:- • Eye splice, • Back splice, • Short splice, • Sail makers whipping, • Common whipping, • West countryman's
Context of and specific resources for assessment	Assessment of the safe and effective application of knowledge and skill to workplace tasks (performance) must be undertaken using the National OHS endorsed Assessment Instrument. Assessment of performance must be undertaken either in the workplace or in a realistically simulated workplace setting. Assessors must ensure that the assessment in the workplace is organised to ensure that all the required equipment and materials and a suitable working area is made available to suit the assessment and the workplace. Assessment must occur under standard and authorised work practices, safety requirements and environmental constraints. Assessment is to comply with the requirements of any relevant Standards or operating procedures for basic rigging. Applicants must have access to: • personal protective equipment (PPE) for the purpose of the Performance Assessment. • appropriate safety equipment in safe condition • appropriate rigging equipment, associated equipment associated plant in safe condition as described in the endorsed assessment instrument • communication equipment (e.g. two-way

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	radios) where applicable • appropriate materials as required for safe erection of structures • appropriate materials for conducting fibre rope slicing, whipping, knots, bends and hitches.
Method of assessment	Assessment must be conducted using the national OHS endorsed Assessment Instruments. These Instruments provide advice on their application. The use of **'simulators'** in the assessment of this unit of competency is **not acceptable**. Assessment may be in conjunction with the assessment of other units of competency. Assessment methods must confirm consistency and accuracy of performance together with application of underpinning knowledge. Assessment must confirm a reasonable inference that competency is not only able to be satisfied under the particular circumstance, but is able to be transferred to other circumstances.
Guidance information for assessment	Further information about endorsed Assessment Instruments may be obtained from state/territory OHS regulators.

Range Statement

RANGE STATEMENT

The range statement relates to the unit of competency as a whole. It allows for different work environments and situations that may affect performance. Bold italicised wording, if used in the performance criteria, is detailed below. Essential operating conditions that may be present with training and assessment (depending on the work situation, needs of the candidate, accessibility of the item, and local industry and regional contexts) may also be included.

Hazards may include but are not limited to:	• ground stability (e.g. ground condition, recently filled trenches, slopes) • overhead hazards (e.g. power lines, service pipes) (**NB**: minimum clearance distance from powerlines or electrical equipment as determined by relevant state authority or

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	electrical supply authority.) • traffic (e.g. pedestrians, vehicles, other plant) • insufficient lighting • environmental conditions (e.g. wind, lightning, storms) • other specific hazards (e.g. dangerous materials).
Hazard control measures:	Refers to the systematic process of eliminating or reducing the risk to personnel and property through the application of controls. It includes the application of the hierarchy of control, the six-step preference of control measures to manage and control risk: • elimination • substitution • isolation • engineering control measures • using safe work practices • personal protective equipment.
Appropriate standards may include:	• codes of practice • legislation • Australian Standards • manufacturer's specifications • industry standards (where applicable).
Site Information may include, but not limited to:	• local conditions such as access and egress, • work method statements, • site specific job safety analyses and other site specific documentation as required. • task plans / Schedules and structural plans.
Forces and Loads may include, but not limited to:	• dead loads • live loads • static load • dynamic loads • wind loads.
Structures may include but are not limited to:	• structural steel • precast panels.
Associated plant may include but not limited to:	• static lines • safety nets • hoists

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RANGE STATEMENT

	• mast climbers • loading platforms.
Appropriate personnel may include:	• engineers • supervisors • colleagues • managers who are authorised to take responsibility for the workplace or operations.

Rigging Equipment may include but is not limited to:	• scaffolds
	• elevated work platforms
	• personnel box
	• cantilevered crane loading platforms
	• mast climbers.
	• safety screens and shutters
	• cranes including but not limited to:
	  • non-slewing cranes
	  • mobile slewing cranes
	  • vehicle loading cranes
	  • tower cranes
	  • self-erecting tower cranes
	  • portal boom cranes
	  • derrick cranes
	  • bridge and gantry cranes.

Associated equipment may include but is not limited to:	• all types of power and manually operated lifting gear • fibre ropes • flexible steel wire rope (FSWR) • chains • wire and synthetic slings • shackles • terminations • wedge sockets • eye bolts • beam clamps • plate clamps • rope grips • turnbuckles • rigging screws • chain blocks • lever blocks • lever-action winches

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RANGE STATEMENT

	• sheaves • spreader bars • lifting beams • jacks • levers • skates • wedges • rollers • girder trolley
Procedures may include but is not limited to:	• manufacturer's guidelines (instructions, specifications or checklists) • industry operating procedures, relevant codes of practice • workplace procedures (work instructions, operating procedures, checklists).
Safety Equipment may include but not limited to:	• safety harness • energy absorber • lanyard • inertia reel • static safety lines • safety nets.
Communication Methods may include but is not limited to:	• verbal and non-verbal language • written instructions • signage • hand signals • listening, • questioning to confirm understanding, and appropriate worksite protocol. **NB**: Mobile phones are not to be used for signalling purposes during the rigging process.
Communication equipment may include but is not limited to:	• fixed channel two-way radios
Hazard prevention/control measures may include but is not limited to:	• safety tags on electrical switches/isolators • powerlines are insulated • safety observer used inside exclusion zone • power disconnected • traffic barricades and control • pedestrian barricades • trench covers

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RANGE STATEMENT

	• movement of obstructions • personal protective equipment • adequate illumination • safety shutters and screens.
Ground suitability may include but is not limited to:	• rough uneven ground • backfilled ground • soft soils • hard compacted soil • rock • bitumen • concrete • suspended concrete floors • building roofs • landings • ground bearing pressure.
Appropriate personnel may include but not limited to	• other riggers • doggers • crane operators.
Temporary connections may include but not limited to:	• knots • bends • hitches • spicing • whipping.
Flexible Steel Wire Rope (***FSWR***) includes:	• identification, uses and connections. May include termination for: • static lines, • guys, • purchase systems, • lashing, • cranes, • hoist and winch ropes.

Unit Sector(s)

Unit sector Construction

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Co-requisite units

Co-requisite units Nil

Functional area

Functional area

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CPCCLRG3002A Licence to perform rigging intermediate level

Modification History

Not Applicable

Unit Descriptor

Unit descriptor

This unit specifies the outcomes required to perform rigging work at the intermediate level, which includes all the outcomes for rigging work at the basic level, and also includes rigging of cranes, rigging of conveyors, rigging of dredges and excavators, rigging associated with tilt slabs, rigging associated with demolition work, and dual lifts for licensing purposes.

Application of the Unit

Application of the unit

This unit requires the applicant to be able plan the work, select and inspect equipment, set up task, erect structures and plant and dismantle structures and plant.

This unit is based upon the National Standard for Licensing Persons Performing High Risk Work.

This unit in its current form meets state and territory licensing requirements. Any alteration will result in a unit which is not acceptable to regulators for the purpose of licensing.

This unit has a pre-requisite requirement. This requirement may be met by either the successful completion of the unit *CPCCLRG3001A Licence to perform rigging basic level* or holding a valid licence for basic rigging.

Licensing/Regulatory Information

Refer to Unit Descriptor

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Pre-Requisites

Prerequisite units

CPCCLRG3001A	Licence to perform rigging basic level

Employability Skills Information

Employability skills This unit contains employability skills.

Elements and Performance Criteria Pre-Content

Elements describe the essential outcomes of a unit of competency.	Performance criteria describe the performance needed to demonstrate achievement of the element. Where bold italicised text is used, further information is detailed in the required skills and knowledge section and the range statement. Assessment of performance is to be consistent with the evidence guide.

Elements and Performance Criteria

ELEMENT	PERFORMANCE CRITERIA
1. Plan job.	1.1. Task to be undertaken is assessed 1.2. Potential workplace ***hazards*** are identified 1.3. ***Hazard control measures*** are identified consistent with ***appropriate standards*** to ensure the safety of personnel and equipment 1.4. Site information is obtained 1.5. All ***forces and loads*** associated with erecting and dismantling ***structures*** and ***associated plant*** are considered in consultation with ***appropriate personnel***. 1.6. ***Rigging equipment*** and ***associated equipment*** are identified in consultation with appropriate personnel

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ELEMENT	PERFORMANCE CRITERIA
	according to ***procedures*** and site information.
	1.7. *Safety equipment* is identified.
	1.8. Appropriate ***communication methods*** are identified with appropriate personnel.
2. Select and inspect equipment.	2.1. Rigging equipment and associated equipment are selected and inspected according to procedures and the appropriate standard.
	2.2. Safety equipment is selected and inspected according to procedures.
	2.3. All defective rigging equipment, associated equipment and safety equipment is isolated, reported and recorded according to procedures.
	2.4. ***Communication equipment*** is selected and inspected for serviceability (where applicable)
3. Set up tasks.	3.1. Appropriate ***hazard prevention***/***control measures*** are applied to the work area according to procedures.
	3.2. ***Ground suitability*** is inspected and checked (where appropriate).
	3.3. Site information is reviewed, interpreted and communicated to appropriate personnel and ***appropriate personnel***.
	3.4. All forces and loads associated with erecting and dismantling structures and associated plant are determined in consultation with appropriate personnel.
	3.5. Safety equipment is fitted and worn correctly (where appropriate).
	3.6. Rigging equipment and associated plant are positioned for work application and stability according to procedures.
4. Erect structures and plant.	4.1. Structures and associated plant is erected according to procedures and site information.
	4.2. Stability of structures and associated plant is maintained during erection according to procedures.
	4.3. Work is conducted safely at heights including safe and effective use of safety equipment.
	4.4. Appropriate communication methods and communication equipment, are used to co-ordinate the tasks.
	4.5. Temporary guys, ties, propping and shoring, including ***flexible steel wire rope***, and tubing, are connected where required.

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ELEMENT	PERFORMANCE CRITERIA
	4.6. Associated plant and rigging equipment is used according to procedures and the appropriate standard. 4.7. Associated equipment is used in a safe and appropriate manner. 4.8. The completed task is inspected according to the appropriate standard. 4.9. Excess materials are removed from the work area (where applicable)
5. Dismantle structures and plant.	5.1. Structures and associated plant are dismantled according to procedures and the appropriate standard. 5.2. Work is conducted safely at heights including safe and effective use of safety equipment. 5.3. Stability of structures and associated plant is maintained during dismantling according to procedures. 5.4. Rigging equipment, associated equipment, safety equipment and associated plant are inspected for damage and defects 5.5. All defective rigging equipment, associated equipment, associated plant and safety equipment are isolated reported and recorded according to procedures. 5.6. Rigging equipment and associated equipment are stored according to procedures and the appropriate standard. 5.7. Hazard prevention/control measures are removed (where appropriate)

Required Skills and Knowledge

REQUIRED SKILLS AND KNOWLEDGE

This section describes the skills and knowledge required for this unit.

Required skills

Required skills for this unit are:

- ability to calculate Safe Working Load (SWL) and Working Load Limit (WLL)

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REQUIRED SKILLS AND KNOWLEDGE

- ability to erect and dismantle, level, plumb and stabilise associated plant and structures
- ability to work safely at heights including the correct application of safety equipment.
- accurate interpretation of structural charts and structural plans (site information)
- correct application and use of all rigging and associated equipment
- risk assessment and hazard control strategies
- interpersonal and communication skills at a level sufficient to site/workplace requirements. This includes the relevant communication methods and equipment.
- verify problems and equipment faults and demonstrate appropriate response.

Required knowledge

Required knowledge for this unit is:

- appropriate mathematical procedures for estimation and measurement of loads
- ability to interpret manufacturer's specifications for all plant and equipment use in rigging operations
- knowledge of principles relating to all plant, equipment and structural stability
- knowledge of the types and functions of rigging, safety and associated equipment including an understanding of their limitations
- organisational and workplace standards, requirements, policies and procedures for rigging
- understanding of the hierarchy of hazard identification and control
- relevant Commonwealth, state or territory and local government OHS legislation, standards and codes of practice for undertaking rigging activities
- understanding of inspection and maintenance requirements of a wide range of appropriate plant and equipment in line with Australian Standards or manufacturer's specifications
- estimation of ground bearing pressures of the full range of soil types and associated ground conditions for setting up plant and equipment.

Evidence Guide

EVIDENCE GUIDE

The evidence guide provides advice on assessment and must be read in conjunction with the performance criteria, required skills and knowledge, range statement and the Assessment Guidelines for the Training Package.

Overview of assessment	Successful assessment of this unit meets the competency requirement of the National Standard

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EVIDENCE GUIDE

	for licensing Persons Performing High Risk Work. State/Territory OHS regulators have mandated the use of Assessment Instruments and Instructions for Assessment for this unit which have been endorsed by the national body responsible for OHS matters.

Critical aspects for assessment and evidence required to demonstrate competency in this unit	A person who demonstrates competency in this unit must be able to provide evidence of the ability to:
	• comply with OHS licensing legislation.
	• effectively communicate and work safely with others in the work area.
	• effectively conduct risk assessment and management procedures.
	• effectively complete the following tasks:
	  • adding and removing a tower crane section, or
	  • adding and removing a crane lattice boom section, or
	  • erecting a non guyed tower (e.g. light tower, and
	  • perform a multiple crane lift, or
	  • a multiple winch lift, or
	  • a combination of a crane and winch lift, and
	  • lifting and installing a series of tilt-up panels, or
	  • lifting and installing a series of scenery panels (i.e. entertainment industry), and
	  • demolish/remove a series of tilt-up panel structures, or
	  • demolish/remove a series of scenery panel structures, and
	  • demolishing a concrete encased structural steel column and beam.
	• **NB**: All specifications for these performance tasks are detailed in the endorsed assessment instrument.
	• effectively conduct pre and post operational checks of intermediate rigging equipment.

Context of and specific resources for assessment	Assessment of the safe and effective application of knowledge and skill to workplace tasks (performance) must be undertaken using the

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EVIDENCE GUIDE

	endorsed Assessment Instrument. Assessment of performance must be undertaken either in the workplace or in a realistically simulated workplace setting. Assessors must ensure that the assessment in the workplace is organised to ensure that all the required equipment and materials and a suitable working area is made available to suit the assessment and the workplace. Assessment must occur under standard and authorised work practices, safety requirements and environmental constraints. Assessment is to comply with relevant appropriate standard requirements. Applicants must have access to: • personal protective equipment (PPE) for the purpose of the Performance Assessment • appropriate safety equipment is safe condition • appropriate rigging equipment, associated equipment associated plant in safe condition as described in the endorsed assessment instrument • communication equipment (e.g. radios) where applicable • appropriate materials as required for safe erection of structures.
Method of assessment	Assessment must be conducted using the endorsed Assessment Instruments. These Instruments provide advice on their application. The use of **'simulators'** in the assessment of this unit of competency is **not acceptable**. Assessment may be in conjunction with the assessment of other units of competency. Assessment methods must confirm consistency and accuracy of performance together with application of underpinning knowledge. Assessment must confirm a reasonable inference that competency is not only able to be satisfied under the particular circumstance, but is able to be transferred to other circumstances.

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EVIDENCE GUIDE

Guidance information for assessment	Further information about endorsed Assessment Instruments may be obtained from state/territory OHS regulators.

Range Statement

RANGE STATEMENT

The range statement relates to the unit of competency as a whole. It allows for different work environments and situations that may affect performance. Bold italicised wording, if used in the performance criteria, is detailed below. Essential operating conditions that may be present with training and assessment (depending on the work situation, needs of the candidate, accessibility of the item, and local industry and regional contexts) may also be included.

Hazards may include but not limited to:	• ground stability (e.g. ground condition, recently filled trenches, slopes) • overhead hazards (e.g. power lines, service pipes) (**NB**: Minimum clearance distance from powerlines or electrical equipment as determined by relevant state authority or electrical supply authority) • traffic (e.g. pedestrians, vehicles, other plant) • insufficient lighting • environmental conditions (e.g. wind, lightning, storms) • other specific hazards (e.g. dangerous materials).
Hazard control measures:	Refers to the systematic process of eliminating or reducing the risk to personnel and property through the application of controls. It includes the application of the hierarchy of control, the six-step preference of control measures to manage and control risk: • elimination • substitution • isolation • engineering control measures • using safe work practices • personal protective equipment.

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RANGE STATEMENT

Appropriate standards may include but are not limited to:	• codes of practice • legislation • Australian Standards • manufacturer's specifications • industry standards (where applicable).
Site Information may include but is not limited to:	• local conditions such as access and egress • work method statements • site-specific job safety analyses and other site specific documentation as required • task plans /schedules and structural plans.
Forces and Loads may include but are not limited to:	• dead loads • live loads • static load • dynamic loads • wind loads.
Structures may include but not limited to:	• concrete tilt-up panels • scenery panels (used in entertainment) • non guyed light towers.
Associated plant may include but is not limited to:	• all types of cranes • conveyors • dredges • excavators.
Appropriate personnel may include but not limited to:	• supervisors • engineers • colleagues • managers who are authorised to take responsibility for the workplace or operations.

Rigging Equipment may include but is not limited to:	• scaffolds
	• elevated work platforms
	• stages
	• personnel box
	• cantilevered crane loading platforms,
	• mast climbers
	• safety screens and shutters
	• cranes including but not limited to:
	  • non-slewing cranes
	  • mobile slewing cranes
	  • vehicle loading cranes
	  • tower cranes

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RANGE STATEMENT

	• self-erecting tower cranes • portal boom cranes • derrick cranes • bridge and gantry cranes.
Associated equipment may include but is not limited to:	• all associated equipment at the basic rigging level, and • lifting clutches (swift lifts) • chain motors.
Procedures may include but are not limited to:	• manufacturer's guidelines (instructions, specifications or checklists) • industry operating procedures, relevant codes of practice • workplace procedures (work instructions, operating procedures, checklists).
Safety Equipment may include but not limited to:	• safety harness • energy absorber • lanyard • inertia reel • safety nets • static lines.
Communication Methods may include but not limited to:	• verbal and non-verbal language • written instructions • signage • hand signals • listening, • questioning to confirm understanding, and appropriate worksite protocol. **NB**: Mobile phones are not to be used for signalling purposes during the rigging process.
Communication equipment may include but is not limited to:	• fixed channel two-way radios
Hazard prevention/control measures may include but is not limited to:	• safety tags on electrical switches/isolators • powerlines are insulated • safety observer used inside exclusion zone • power disconnected • traffic barricades and control • pedestrian barricades • trench covers • movement of obstructions

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RANGE STATEMENT

	• personal protective equipment • adequate illumination.
Ground suitability may include but is not limited to:	• rough uneven ground • backfilled ground • soft soils • hard compacted soil • rock • bitumen • concrete • suspended concrete floors • building roofs • landings • ground bearing pressure.
Appropriate personnel may include but not limited to:	• other riggers • doggers • crane operators.
Flexible Steel Wire Rope (***FSWR***) includes:	• identification, uses and connections. May include termination for: • static lines • guys • purchase systems • lashing • cranes • hoist and winch ropes.

Unit Sector(s)

Unit sector Construction

Co-requisite units

Co-requisite units Nil

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Functional area

Functional area

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CPCCLRG4001A Licence to perform rigging advanced level

Modification History

Not Applicable

Unit Descriptor

Unit descriptor

This unit specifies the outcomes required to perform rigging work at the advanced level, which includes all the outcomes for rigging work at the basic and intermediate levels, and also includes rigging of gin poles and shear legs, flying foxes and cable ways, guyed derricks and structures, and suspended scaffolds and fabricated hung scaffolds for licensing purposes.

Application of the Unit

Application of the unit

This unit requires the applicant to be able plan the work, select and inspect equipment, set up task, erect structures and plant and dismantle structures and plant.

This unit is based upon the National Standard for Licensing Persons Performing High Risk Work.

This unit in its current form meets state and territory licensing requirements. Any alteration will result in a unit which is not acceptable to regulators for the purpose of licensing.

This unit has a pre-requisite requirement. This requirement may be met by either the successful completion of the unit *CPCCLRG3002A Licence to perform rigging intermediate level* or holding a valid licence for intermediate rigging.

Licensing/Regulatory Information

Refer to Unit Descriptor

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Pre-Requisites

Prerequisite units

CPCCLRG3002A	Licence to perform rigging intermediate level

Employability Skills Information

Employability skills This unit contains employability skills.

Elements and Performance Criteria Pre-Content

Elements describe the essential outcomes of a unit of competency.	Performance criteria describe the performance needed to demonstrate achievement of the element. Where bold italicised text is used, further information is detailed in the required skills and knowledge section and the range statement. Assessment of performance is to be consistent with the evidence guide.

Elements and Performance Criteria

ELEMENT	PERFORMANCE CRITERIA
1. Plan job.	1.1. Task to be undertaken is assessed. 1.2. Potential workplace ***hazards*** are identified. 1.3. ***Hazard control measures*** are identified consistent with ***appropriate standards*** to ensure the safety of personnel and equipment. 1.4. Site information is obtained. 1.5. All ***forces and loads*** associated with erecting and dismantling ***associated plant*** are considered in consultation with ***appropriate personnel***. 1.6. ***Rigging equipment*** and ***associated equipment*** are identified in consultation with appropriate personnel according to ***procedures*** and site information.

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ELEMENT	PERFORMANCE CRITERIA
	1.7. ***Safety equipment*** is identified. 1.8. Appropriate communication methods are identified with appropriate personnel.
2. Select and inspect equipment.	2.1. Rigging equipment and associated equipment are selected and inspected according to procedures and the appropriate standard. 2.2. Safety equipment is selected and inspected according to procedures. 2.3. All defective rigging equipment, associated equipment and safety equipment is isolated, reported and recorded according to procedures. 2.4. ***Communication equipment*** is selected and inspected for serviceability (where applicable)
3. Prepare site and equipment.	3.1. Appropriate ***hazard prevention***/***control measures*** are applied to the work area according to procedures. 3.2. ***Ground suitability*** is inspected and checked (where appropriate). 3.3. Site information is reviewed interpreted and communicated to appropriate personnel and appropriate personnel. 3.4. All forces and loads associated with erecting and dismantling associated plant are determined in consultation with appropriate personnel. 3.5. Safety equipment is fitted and worn correctly (where appropriate). 3.6. Rigging equipment and associated plant are positioned for work application and stability according to procedures. 3.7. Methods of applying ***temporary connections*** using fibre rope are applied according to procedures and the appropriate standard.
4. Erect structures and plant.	4.1. Associated plant is erected according to procedures and site information. 4.2. Stability of associated plant is maintained during erection according to procedures. 4.3. Work is conducted safely at heights including safe and effective use of safety equipment. 4.4. Appropriate communication methods and communication equipment, are used to co-ordinate the tasks. 4.5. Temporary guys, ties, propping and shoring, including ***flexible steel wire rope***, and tubing, are

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ELEMENT	PERFORMANCE CRITERIA
	connected where required. 4.6. Associated plant and rigging equipment is used according to procedures and the appropriate standard. 4.7. Associated equipment is used in a safe and appropriate manner. 4.8. The completed task is inspected according to the appropriate standard. 4.9. Excess materials are removed from the work area (where applicable)
5. Dismantle structures and plant.	5.1. Associated plant is dismantled according to procedures and the appropriate standard. 5.2. Work is conducted safely at heights including safe and effective use of safety equipment. 5.3. Stability of associated plant is maintained during dismantling according to procedures. 5.4. Rigging equipment, associated equipment, safety equipment and associated plant are inspected for damage and defects 5.5. All defective rigging equipment, associated equipment, associated plant and safety equipment are isolated reported and recorded according to procedures. 5.6. Rigging equipment and associated equipment are stored according to procedures and the appropriate standard. 5.7. Hazard prevention/control measures are removed (where appropriate)

Required Skills and Knowledge

REQUIRED SKILLS AND KNOWLEDGE

This section describes the skills and knowledge required for this unit.

Required skills

Required skills for this unit are:

- ability to calculate Safe Working Load (SWL) and Working Load Limit (WLL)
- ability to erect and dismantle, level, plumb and stabilise associated plant

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REQUIRED SKILLS AND KNOWLEDGE

- ability to work safely at heights including the correct application of safety equipment.
- accurate interpretation of structural charts and structural plans (Site information)
- applying methods for making temporary connections of ropes using fibre and synthetic types
- correct application and use of all rigging and associated equipment
- risk assessment and hazard control strategies
- interpersonal and communication skills at a level sufficient to site/workplace requirements. This includes the relevant communication methods and equipment.
- verify problems and equipment faults and demonstrate appropriate response.

Required knowledge

Required knowledge for this unit is:

- appropriate mathematical procedures for estimation and measurement of loads
- ability to interpret manufacturer's specifications for all plant and equipment use in rigging operations
- knowledge of principles relating to all plant, equipment and structural stability
- knowledge of the types and functions of rigging, safety and associated equipment including an understanding of their limitations
- organisational and workplace standards, requirements, policies and procedures for rigging
- understanding of the hierarchy of hazard identification and control
- relevant Commonwealth, state or territory and local government OHS legislation, standards and codes of practice for undertaking rigging activities
- understanding of inspection and maintenance requirements of a wide range of appropriate plant and equipment in line with Australian Standards or manufacturer's specifications
- estimation of ground bearing pressures of the full range of soil types and associated ground conditions for setting up plant and equipment.

Evidence Guide

EVIDENCE GUIDE

The evidence guide provides advice on assessment and must be read in conjunction with the performance criteria, required skills and knowledge, range statement and the Assessment Guidelines for the Training Package.

Overview of assessment	Successful assessment of this unit meets the competency requirement of the National Standard

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EVIDENCE GUIDE

	for licensing Persons Performing High Risk Work. State/Territory OHS regulators have mandated the use of Assessment Instruments and Instructions for Assessment for this unit which have been endorsed by the national body responsible for OHS matters

Critical aspects for assessment and evidence required to demonstrate competency in this unit	A person who demonstrates competency in this unit must be able to provide evidence of the ability to:
	• comply with OHS licensing legislation.
	• effectively communicate and work safely with others in the work area.
	• effectively conduct risk assessment and management procedures.
	• effectively complete the following tasks:
	  • rig a span rope, or
	  • rig a flying fox, and
	  • install a swinging stage, or
	  • install a bosuns chair, and
	  • set up a gin pole and conduct a lift with a powered winch, and
	  • erect and dismantle a hung or suspended scaffold
	
	NB: All specifications for these performance tasks are detailed in the endorsed assessment instrument.
	• effectively demonstrate the following knots, bends and hitches:
	  • Alpine hitch
	  • Bosun chair hitch
	  • Prusik hitch
	  • Figure eight
	• effectively conduct pre and post operational checks of advanced rigging equipment.

Context of and specific resources for assessment	Assessment of the safe and effective application of knowledge and skill to workplace tasks (performance) must be undertaken using the endorsed Assessment Instrument. Assessment of performance must be undertaken either in the workplace or in a realistically

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EVIDENCE GUIDE

	simulated workplace setting. Assessors must ensure that the assessment in the workplace is organised to ensure that all the required equipment and materials and a suitable working area is made available to suit the assessment and the workplace. Assessment must occur under standard and authorised work practices, safety requirements and environmental constraints. Assessment is to comply with relevant appropriate standard requirements. Applicants must have access to: • personal protective equipment (PPE) for the purpose of the Performance Assessment • appropriate safety equipment is safe condition • Appropriate rigging equipment, associated equipment associated plant in safe condition as described in the endorsed assessment instrument • communication equipment (e.g. radios) where applicable • appropriate materials as required for safe erection and dismantling of performance tasks • appropriate materials for conducting fibre rope knots, bends and hitches.
Method of assessment	Assessment must be conducted using the endorsed Assessment Instruments. These Instruments provide advice on their application. The use of **'simulators'** in the assessment of this unit of competency is **not acceptable**. Assessment may be in conjunction with the assessment of other units of competency. Assessment methods must confirm consistency and accuracy of performance together with application of underpinning knowledge. Assessment must confirm a reasonable inference that competency is not only able to be satisfied under the particular circumstance, but is able to be transferred to other circumstances.
Guidance information for	Further information about endorsed Assessment

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EVIDENCE GUIDE

assessment	Instruments may be obtained from state/territory OHS regulators.

Range Statement

RANGE STATEMENT

The range statement relates to the unit of competency as a whole. It allows for different work environments and situations that may affect performance. Bold italicised wording, if used in the performance criteria, is detailed below. Essential operating conditions that may be present with training and assessment (depending on the work situation, needs of the candidate, accessibility of the item, and local industry and regional contexts) may also be included.

Hazards may include but are not limited to:	• ground stability (e.g. ground condition, recently filled trenches, slopes) • overhead hazards (e.g. power lines, service pipes) (**NB**: Minimum clearance distance from powerlines or electrical equipment as determined by relevant state authority or electrical supply authority) • traffic (e.g. pedestrians, vehicles, other plant) • insufficient lighting • environmental conditions (e.g. wind, lightning, storms) • other specific hazards (e.g. dangerous materials).
Hazard control measures:	Refers to the systematic process of eliminating or reducing the risk to personnel and property through the application of controls. It includes the application of the hierarchy of control, the six-step preference of control measures to manage and control risk: • elimination • substitution • isolation • engineering control measures • using safe work practices • personal protective equipment.
Appropriate standards may	• codes of practice

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RANGE STATEMENT

include:	• legislation • Australian Standards • manufacturer's specifications • industry standards (where applicable).
Site information may include but is not limited to:	• local conditions such as access and egress • work method statements • site-specific job safety analyses and other site specific documentation as required • task plans /schedules and structural plans.
Forces and loads may include but are not limited to:	• dead loads • live loads • static load • dynamic loads • wind loads.
Associated plant may include but is not limited to:	• gin poles • flying foxes • shear legs • cable ways • guyed derricks • structures, and • suspended scaffolds • fabricated hung scaffolds.
Appropriate personnel may include but not limited to:	• engineers • supervisors • colleagues • managers who are authorised to take responsibility for the workplace or operations.

Rigging equipment may include but is not limited to:	• scaffolds
	• elevated work platforms
	• stages
	• personnel box
	• cantilevered crane loading platforms
	• mast climbers
	• safety screens and shutters
	• cranes including but not limited to:
	  • non-slewing cranes
	  • mobile slewing cranes
	  • vehicle loading cranes
	  • tower cranes
	  • self-erecting tower cranes

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RANGE STATEMENT

	• portal boom cranes • derrick cranes • bridge and gantry.
Associated equipment may include but not limited to:	• all associated equipment at the basic and intermediate rigging level.
Procedures may include but not limited to:	• manufacturer's guidelines (instructions, specifications or checklists) • industry operating procedures, relevant codes of practice • workplace procedures (work instructions, operating procedures, checklists).
Safety equipment may include but not limited to:	• safety harness • energy absorber • lanyard • inertia reel • safety nets • static lines.
Communication methods may include but are not limited to:	• verbal and non-verbal language • written instructions • signage • hand signals • listening • questioning to confirm understanding • appropriate worksite protocol. **NB**: Mobile phones are not to be used for signalling purposes during the rigging process.
Appropriate personnel may include but are not limited to:	• other riggers • doggers • crane operators.
Communication equipment may include but is not limited to:	• fixed channel two-way radios.
Hazard prevention/control measures may include but are not limited to:	• safety tags on electrical switches/isolators • powerlines are insulated • safety observer used inside exclusion zone • power disconnected • traffic barricades and control • pedestrian barricades • trench covers

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RANGE STATEMENT

	• movement of obstructions • personal protective equipment • adequate illumination.
Ground suitability may include but not limited to:	• rough uneven ground • backfilled ground • soft soils • hard compacted soil • rock • bitumen • concrete • suspended concrete floors • building roofs • landings • ground bearing pressure.
Temporary connections may include but not limited to:	• knots • bends • hitches • whipping.
Flexible Steel Wire Rope (***FSWR***) ***includes***:	• identification, uses and connections. May include termination for: • static lines • guys • purchase systems • lashing • cranes • hoist and winch ropes.

Unit Sector(s)

Unit sector Construction

Co-requisite units

Co-requisite units Nil

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Co-requisite units Nil

Functional area

Functional area

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CPCCLSF2001A Licence to erect, alter and dismantle scaffolding basic level

Modification History

Not Applicable

Unit Descriptor

Unit descriptor This unit specifies the outcomes required to erect, alter and dismantle scaffolding at the basic level, consisting of scaffolding work connected with the operation or use of modular or pre-fabricated scaffolds, cantilevered materials hoists with a maximum working load of 500kg, ropes and gin wheels, safety nets and static lines, and bracket scaffolds (tank and formwork) for licensing purposes.

Application of the Unit

Application of the unit This unit covers the scope of work to plan the job, select and inspect equipment, set up task, erect scaffold and scaffold equipment and dismantle scaffold and scaffold equipment.

This unit is based upon the National Standard for Licensing Persons Performing High Risk Work.

This unit in its current form it state and territory licensing requirements. Any alteration will result in a unit which is not acceptable to regulators for the purpose of licensing.

Licensing/Regulatory Information

Refer to Unit Descriptor

Pre-Requisites

Prerequisite units Nil

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Prerequisite units Nil

Employability Skills Information

Employability skills This unit contains employability skills.

Elements and Performance Criteria Pre-Content

Elements describe the essential outcomes of a unit of competency.	Performance criteria describe the performance needed to demonstrate achievement of the element. Where bold italicised text is used, further information is detailed in the required skills and knowledge section and the range statement. Assessment of performance is to be consistent with the evidence guide.

Elements and Performance Criteria

ELEMENT	PERFORMANCE CRITERIA
1. Plan job.	1.1. Task to be undertaken is assessed. 1.2. Potential workplace ***hazards*** are identified. 1.3. ***Hazard control measures*** are identified consistent with ***appropriate standards*** to ensure the safety of personnel and equipment. 1.4. Site information is obtained. 1.5. ***Scaffold***, ***associated equipment*** and ***scaffolding equipment*** are identified from site information and in consultation with ***appropriate personnel*** (where applicable). 1.6. ***Safety equipment*** is identified. 1.7. All ***forces and loads*** exerted on and by the scaffold and/or scaffolding equipment are determined and calculated. 1.8. Appropriate ***communication methods*** are identified

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ELEMENT	PERFORMANCE CRITERIA
	with appropriate personnel.
2. Select and inspect plant and equipment.	2.1. Scaffold, associated equipment and scaffold equipment are selected and inspected according to ***procedures*** and site information. 2.2. Safety equipment is selected and inspected according to procedures. 2.3. All defective Scaffold, associated equipment, scaffold equipment and safety equipment are isolated according to procedures. 2.4. All defective Scaffold, associated equipment, scaffold equipment and safety equipment are reported and recorded according to procedures. 2.5. ***Communication equipment*** is selected and inspected for serviceability (where applicable).
3. Set up task	3.1. Appropriate ***hazard prevention***/***control measures*** are applied to the work area according to procedures. 3.2. Ground suitability is checked. 3.3. Appropriate footings are prepared to support scaffold and scaffold equipment according to procedures and the appropriate standard. 3.4. Scaffold and scaffold equipment are prepared for erection according to procedures and the appropriate standard. 3.5. Safety equipment is fitted and secured according to procedures (where applicable). 3.6. Scaffold and scaffold equipment are positioned for work application and ***stability*** according to procedures and the appropriate standard.
4. Erect scaffold and scaffold equipment.	4.1. Scaffold and scaffold equipment are erected according to procedures and the appropriate standard. 4.2. Work is conducted safely at heights including safe and effective use of safety equipment. 4.3. Scaffold and scaffold equipment are erected consistent with site information. 4.4. Appropriate communication methods are used to coordinate the tasks. 4.5. Completed tasks are inspected for compliance with the appropriate standard. 4.6. Handover certificate is completed as required and handed to appropriate personnel. 4.7. Excess materials from the work area are removed

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ELEMENT	PERFORMANCE CRITERIA
	(where applicable).
5. Dismantle scaffold and scaffold equipment.	5.1. Scaffold and scaffold equipment are dismantled according to procedures and the appropriate standard. 5.2. Work is conducted safely at heights including safe and effective use of safety equipment. 5.3. Scaffold, associated equipment and scaffold equipment are inspected for damage and defects. 5.4. All damaged and defective scaffold, associated equipment and scaffold equipment are tagged and isolated according to procedures. 5.5. Hazard prevention/control measures are removed (where appropriate). 5.6. All damaged and defective scaffold, associated equipment and scaffold equipment are reported and recorded according to procedures and appropriate action taken.

Required Skills and Knowledge

REQUIRED SKILLS AND KNOWLEDGE

This section describes the skills and knowledge required for this unit.

Required skills

Required skills for this unit are:

- ability to calculate Safe Working Load (SWL) and Working Load Limit (WLL)
- ability to erect scaffold within the scope of the basic scaffolder
- ability to erect, level, plumb and stabilise cantilever hoists and scaffolds
- ability to interpret manufacturer's specifications for plant and equipment
- ability to work safely at heights
- ability to set up fall arrest systems, including safety nets
- ability to work safely in confined spaces
- accurate interpretation of basic structural charts and structural plans
- applying methods for making temporary connection using fibre ropes
- correct application of all scaffolding equipment
- methods for making temporary connection of guy ropes and static lines using Flexible Steel Wire Rope (FSWR)
- verify problems and equipment faults and demonstrate appropriate response.

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REQUIRED SKILLS AND KNOWLEDGE

Required knowledge

Required knowledge for this unit is:

- use of appropriate mathematical procedures for estimation and measurement of loads Commonwealth, state or territory OHS legislation and local government regulations, including standards and codes of practice relevant to the full range of techniques for undertaking basic scaffolding activities
- knowledge of principles relating to plant and equipment stability
- knowledge of types of scaffolding and their application
- knowledge of scaffolding erection and dismantling techniques
- knowledge of types of hoists, plant and equipment associated with basic scaffolding and their use/s
- risk assessment and control, including understanding of the hierarchy of control
- estimation of bearing pressures of the full range of soil types and associated ground conditions for setting up plant and equipment
- load capabilities of different types of scaffolding constructions
- understanding and application of organisational and workplace standards, requirements, policies and procedures for scaffolding
- safety equipment applicable to scaffolding
- understanding and application of the inspection and maintenance requirements for basic scaffold, associated equipment and scaffold equipment
- uses and limitations of tools and equipment, appropriate to scaffolding tasks and activities.

Evidence Guide

EVIDENCE GUIDE

The evidence guide provides advice on assessment and must be read in conjunction with the performance criteria, required skills and knowledge, range statement and the Assessment Guidelines for the Training Package.

Overview of assessment

Successful assessment of this unit meets the competency requirement of the National Standard for licensing Persons Performing High Risk Work.

State/Territory OHS regulators have mandated the use of Assessment Instruments and Instructions for Assessment endorsed by the national body responsible for OHS matters for the assessment of

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EVIDENCE GUIDE

	this unit.

Critical aspects for assessment and evidence required to demonstrate competency in this unit	A person who demonstrates competency in this unit must be able to provide evidence of the ability to:
	• comply with OHS licensing requirements.
	• effectively communicate and work safely with others in the work area.
	• effectively apply risk assessment and hazard management procedures at a basic scaffolder level.
	• effectively complete the planning, erection and dismantling of a scaffolding system, in accordance with procedures, including a minimum of erect and dismantle:
	  • Modular Scaffold with return and ladder access and platform brackets (hop-up brackets)
	  • Bracket Scaffold
	  • Mobile Scaffold
	  • gin wheel
	  • Cantilever Hoist
	  • safety net and static line
	  • safety screen
	Scaffold to be of a minimum height of at least 5.0 metres above the supporting surface with full edge protection (includes safety screen) for each work platform including toe boards and handrails.
	• correctly demonstrate fibre rope bends and hitches.
	• effectively conduct pre and post operational checks of basic scaffolding.
	• complete handover certificate as required.

Context of and specific resources for assessment	• Assessment of the safe and effective application of knowledge and skill to workplace tasks (performance) must be undertaken using the National OHS endorsed Assessment Instrument • Assessment of performance must be undertaken either in the workplace or in a realistically simulated workplace setting • .Assessors must ensure that the assessment in

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	the workplace is organised to ensure that all the required equipment and materials and a suitable working area is made available to suit the assessment and the workplace
	• Assessment must occur under standard and authorised work practices, safety requirements and environmental constraints for basic scaffolding
	• Applicants must have access to:
	  • personal protective equipment (PPE) for the purpose of the Performance Assessment
	  • appropriate safety equipment in safe condition
	  • appropriate scaffolding and associated scaffolding equipment
	  • communication equipment (e.g. fixed channel two way radios) where applicable
	  • appropriate personnel to assist with the erecting and dismantling of scaffold and scaffold equipment.

Method of assessment	Assessment must be conducted using the national OHS endorsed Assessment Instruments. These Instruments provide advice on their application. Assessment may be in conjunction with the assessment of other units of competency. The use of **'simulators'** in the assessment of this unit of competency is **not acceptable**. Assessment methods must confirm consistency and accuracy of performance together with application of underpinning knowledge. Assessment must confirm a reasonable inference that competency is not only able to be satisfied under the particular circumstance, but is able to be transferred to other circumstances.
Guidance information for assessment	Further information about endorsed Assessment Instruments may be obtained from state/territory OHS regulators.

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Range Statement

RANGE STATEMENT

The range statement relates to the unit of competency as a whole. It allows for different work environments and situations that may affect performance. Bold italicised wording, if used in the performance criteria, is detailed below. Essential operating conditions that may be present with training and assessment (depending on the work situation, needs of the candidate, accessibility of the item, and local industry and regional contexts) may also be included.

Hazards may include but not limited to:	• ground conditions (e.g. ground bearing pressure/s, back filled trenches, underground services, slopes) • overhead hazards (e.g. power lines, service pipes) (minimum clearance distance from powerlines or electrical equipment as determined by relevant state authority or electrical supply authority) • traffic (e.g. pedestrians, vehicles, other plant) • insufficient lighting • environmental conditions (e.g. wind, lightning, storms) • other site specific hazards (e.g. hazardous materials).
Hazard control measures:	Refers to the systematic process of eliminating or reducing the risk to personnel and property through the application of controls. It includes the application of the hierarchy of control, the six-step preference of control measures to manage and control risk: • elimination • substitution • isolation • engineering control measures • using safe work practices • personal protective equipment.
Appropriate standards may include:	• codes of practice • legislation • Australian Standards • manufacturer's specifications • industry standards (where applicable).
Site Information may include, but not be limited to:	• local conditions such as access and egress • work method statements

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RANGE STATEMENT

	• site-specific job safety analyses and other documentation as required • task plans.

Scaffold may include but not limited to:	• mobile scaffolding
	• bracket scaffolding
	• modular scaffolding, including:
	  • steel
	  • fibreglass and
	  • aluminium frame scaffolding
	• prefabricated scaffolding.

Associated equipment may include but not limited to:	• planks
	• flexible steel wire rope and fittings.
	NB: including identification, uses and connections which may include termination for static lines and guys for cantilever hoists.
	• ladders
	• tie tubes and fittings
	• fibre rope
	NB: including identification and uses (natural and synthetic), and connections associated with bends and hitches.
	• stairways and screening
	• hand tools, including, but not limited to:
	  • box spanners
	  • hammers
	  • spirit levels
	  • tape measures
	  • scaffold belts
	  • podgers
	  • hammers
	  • wire nips
	  • wrenches
	  • torpedo levels
	  • shovels
	  • spanners
	  • cutters
	  • hammer drills
	  • sledge hammers

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RANGE STATEMENT

	• wheel barrows and • relevant maintenance equipment.
Scaffolding equipment may include but not limited to:	• materials hoists • gin wheels • safety nets • static lines and fittings.
Appropriate personnel may include, but are not limited to:	• supervisors • colleagues • managers who are authorised to take responsibility for the workplace or operations • other scaffolders • other site personnel as applicable.
Safety equipment may include but not limited to:	• safety harness • energy absorber • lanyard • inertia reel.
Forces and Loads may include, but are not limited to:	• dead loads • live loads • static load • dynamic loads • wind loads.
Communication Methods may include but not limited to:	• verbal and non-verbal language • written instructions • signage • communication signals • listening • questioning to confirm understanding, and appropriate worksite protocol.
Procedures may include but not limited to:	• manufacturer's guidelines (instructions, specifications or checklists) • industry operating procedures, relevant codes of practice • workplace procedures (work instructions, operating procedures, checklists) • reporting and recording procedures such as e.g. equipment defect/s.
Communication equipment may include but is not limited to:	• fixed frequency two way radios • mobile phones.
Hazard prevention/control measures may include but not	• safety tags on electrical switches/isolators • safety observer used inside exclusion zone

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RANGE STATEMENT

limited to:	(e.g. Spotter), to include the use of power line warning systems (e.g. Tiger tails) • power disconnected by competent authority where applicable • traffic and pedestrian barricades and controls • safe and adequate access / egress is established • personal protective equipment • adequate illumination.
Ground suitability may include but not limited to:	• rough uneven ground • backfilled ground • soft soils • hard compacted soil • rock • bitumen • concrete.
Stability may include but is not limited to:	• ground bearing pressure • sole plates/boards • screw jacks • levelling • ties/guys.

Unit Sector(s)

Unit sector Construction

Co-requisite units

Co-requisite units Nil

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Functional area

Functional area

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CPCCLSF3001A Licence to erect, alter and dismantle scaffolding intermediate level

Modification History

Not Applicable

Unit Descriptor

Unit descriptor

This unit specifies the outcomes required to erect, alter and dismantle scaffolding at the Intermediate level which includes use and operation of Cantilevered crane-loading platforms, Cantilevered and spurred scaffolds, Barrow ramps and sloping platforms, perimeter safety screens and shutters Mast climbers, and tube and coupler scaffolds (including tube and coupler covered ways and gantries) for licensing purposes.

Application of the Unit

Application of the unit

This unit covers the scope of work to plan the job, select and inspect equipment, set up task, erect scaffold and scaffold equipment and dismantle scaffold and scaffolding equipment.

This unit is based upon the National Standard for Licensing Persons Performing High Risk Work.

This unit in its current form meets state and territory licensing requirements. Any alteration will result in a unit which is not acceptable to regulators for the purpose of licensing.

This unit has a pre-requisite requirement. This requirement may be met by either the successful completion of the unit *CPCCLSF2001A Licence to erect, alter and dismantle scaffolding basic level* or holding a valid licence for basic scaffolding.

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Licensing/Regulatory Information

Refer to Unit Descriptor

Pre-Requisites

Prerequisite units

CPCCLSF2001A	Licence to erect, alter and dismantle scaffolding basic level

Employability Skills Information

Employability skills This unit contains employability skills.

Elements and Performance Criteria Pre-Content

Elements describe the essential outcomes of a unit of competency.	Performance criteria describe the performance needed to demonstrate achievement of the element. Where bold italicised text is used, further information is detailed in the required skills and knowledge section and the range statement. Assessment of performance is to be consistent with the evidence guide.

Elements and Performance Criteria

ELEMENT	PERFORMANCE CRITERIA
1. Plan job.	1.1. Task to be undertaken is assessed. 1.2. Potential workplace ***hazards*** are identified. 1.3. ***Hazard control measures*** are identified consistent with ***appropriate standards*** to ensure the safety of personnel and equipment. 1.4. Site information is obtained.

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ELEMENT	PERFORMANCE CRITERIA
	1.5. ***Scaffold***, ***associated equipment*** and ***scaffold equipment*** are identified from site information and in consultation with appropriate ***personnel*** (where applicable).
	1.6. ***Safety equipment*** is identified.
	1.7. All ***forces and loads*** exerted on and by the scaffold and/or scaffolding equipment are determined and calculated.
	1.8. Appropriate ***communication methods*** are identified with appropriate personnel.
2. Select and inspect equipment.	2.1. Scaffold, associated equipment and scaffold equipment are selected and inspected according to ***procedures*** and site information.
	2.2. Safety equipment is selected and inspected according to procedures.
	2.3. All defective scaffold, associated equipment, scaffold equipment and safety equipment are isolated according to procedures.
	2.4. All defective scaffold, associated equipment, scaffold equipment and safety equipment are reported and recorded according to procedures.
	2.5. ***Communication equipment*** is selected and inspected for serviceability (where applicable).
3. Set up task.	3.1. Appropriate ***hazard prevention***/***control measures*** are applied to the work area according to procedures.
	3.2. Ground suitability is checked.
	3.3. Appropriate footings are prepared to support scaffold and scaffold equipment according to procedures and the appropriate standard.
	3.4. Scaffold and scaffold equipment are prepared for erection
	3.5. Fit safety equipment and secure according to procedures (where applicable).
	3.6. Scaffold and scaffold equipment are positioned for work application and ***stability*** according to procedures and the appropriate standard.
4. Erect scaffold and scaffolding equipment.	4.1. Scaffold and scaffold equipment are erected according to procedures and the appropriate standard.
	4.2. Work is conducted safely at heights including safe and effective use of safety equipment.
	4.3. Scaffold and scaffold equipment are erected

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ELEMENT	PERFORMANCE CRITERIA
	consistent with site information. 4.4. Appropriate communication methods are used to coordinate the tasks. 4.5. Completed tasks are inspected for compliance with the appropriate standard. 4.6. Handover certificate is completed as required and handed to appropriate personnel. 4.7. Excess materials from the work area are removed (where applicable).
5. Dismantle scaffold and scaffolding equipment.	5.1. Scaffold and scaffold equipment are dismantled according to procedures and the appropriate standard. 5.2. Work is conducted safely at heights including safe and effective use of safety equipment. 5.3. Scaffold, associated equipment and scaffold equipment are inspected for damage and defects. 5.4. All damaged and defective scaffold, associated equipment and scaffold equipment are tagged and isolated according to procedures. 5.5. Hazard prevention/control measures are removed (where appropriate). 5.6. All damaged and defective scaffold, associated equipment and scaffold equipment are reported and recorded according to procedures and appropriate action taken.

Required Skills and Knowledge

REQUIRED SKILLS AND KNOWLEDGE

This section describes the skills and knowledge required for this unit.

Required skills

Required skills for this unit are:

- ability to erect scaffold and scaffolding equipment within the scope of the intermediate scaffolder
- ability to erect, level, plumb and stabilise scaffolds and scaffold equipment within the scope of the intermediate scaffolder
- ability to interpret manufacturer's specifications for plant and equipment

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REQUIRED SKILLS AND KNOWLEDGE

- ability to work safely at heights
- accurate interpretation of basic structural charts and structural plans
- correct application of all scaffolding equipment
- verify problems and equipment faults and demonstrate appropriate response.

Required knowledge

Required knowledge for this unit is:

- use of appropriate mathematical procedures for estimation and measurement of loads
- Commonwealth, state or territory OHS legislation and local government regulations, including standards and codes of practice relevant to the full range of techniques for undertaking intermediate scaffolding activities
- knowledge of principles relating to plant and equipment stability
- knowledge of types of scaffolding and their application
- knowledge of scaffold and scaffold equipment erection and dismantling techniques
- knowledge of types of scaffold and scaffold equipment, associated with intermediate scaffolding and their use/s
- risk assessment and control, including understanding of the hierarchy of control
- load capabilities of different types of scaffolding constructions
- understanding and application of organisational and workplace standards, requirements, policies and procedures for scaffolding
- application of safety equipment applicable to scaffolding
- understanding and application of the inspection and maintenance requirements for intermediate scaffold, associated equipment and scaffold equipment
- uses and limitations of tools and equipment, appropriate to scaffolding tasks and activities.

Evidence Guide

EVIDENCE GUIDE

The evidence guide provides advice on assessment and must be read in conjunction with the performance criteria, required skills and knowledge, range statement and the Assessment Guidelines for the Training Package.

Overview of assessment	Successful assessment of this unit meets the competency requirement of the National Standard for licensing Persons Performing High Risk Work. State/Territory OHS regulators have mandated the use of Assessment Instruments and Instructions for

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	Assessment endorsed by the national body responsible for OHS matters for the assessment of this unit.

Critical aspects for assessment and evidence required to demonstrate competency in this unit	A person who demonstrates competency in this unit must be able to provide evidence of the ability to:
	• Effectively communicate and work safely with others in the work area.
	• Effectively apply risk assessment and hazard management procedures at an intermediate scaffolder level.
	• Effectively complete the planning, erection and dismantling of scaffolding systems, in accordance with procedures, including a minimum of erect and dismantle the following:
	  • Cantilevered and spurred scaffolds
	  • Barrow ramps and/ or sloping platforms
	  • Tube and coupler scaffolds
	  • Cantilevered crane-loading platforms
	  • Mast climbers
	Cantilevered, spurred and tube and coupler scaffolds to be of a minimum height of 5.0 metres above the supporting surface with full edge protection, for each work platform including toe boards and handrails.
	• Apply safety screen to tube and coupler scaffold.
	• Effectively conduct compliance inspections of scaffold and scaffold equipment for intermediate scaffolding.
	• Complete handover certificate as required.

Context of and specific resources for assessment	• Assessment of the safe and effective application of knowledge and skill to workplace tasks (performance) must be undertaken using the National OHS endorsed Assessment Instrument. • Assessment of performance must be undertaken either in the workplace or in a realistically simulated workplace setting. • Assessors must ensure that the assessment in the workplace is organised to ensure that all the required equipment and materials and a

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	suitable working area is made available to suit the assessment and the workplace.
	• Assessment must occur under standard and authorised work practices, safety requirements and environmental constraints for intermediate scaffolding.
	• Applicants must have access to:
	  • personal protective equipment (PPE) for the purpose of the Performance Assessment
	  • appropriate safety equipment in safe condition
	  • appropriate scaffold and scaffold equipment in safe condition
	  • site information as described in the mandated assessment instrument
	  • communication equipment (e.g. fixed channel two way radios) where applicable
	  • appropriate personnel to assist with the erecting and dismantling of scaffold and scaffold equipment.

Method of assessment	Assessment must be conducted using the national OHS endorsed Assessment Instruments. These Instruments provide advice on their application. Assessment may be in conjunction with the assessment of other units of competency. The use of **'simulators'** in the assessment of this unit of competency is **not acceptable**. Assessment methods must confirm consistency and accuracy of performance together with application of underpinning knowledge. Assessment must confirm a reasonable inference that competency is not only able to be satisfied under the particular circumstance, but is able to be transferred to other circumstances.
Guidance information for assessment	Further information about endorsed assessment instruments may be obtained from state/territory OHS regulators.

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Range Statement

RANGE STATEMENT

The range statement relates to the unit of competency as a whole. It allows for different work environments and situations that may affect performance. Bold italicised wording, if used in the performance criteria, is detailed below. Essential operating conditions that may be present with training and assessment (depending on the work situation, needs of the candidate, accessibility of the item, and local industry and regional contexts) may also be included.

Hazards may include but not limited to:	• ground conditions (e.g. ground bearing pressure/s, back filled trenches, underground services, slopes) • overhead hazards (e.g. power lines, service pipes) (minimum clearance distance from powerlines or electrical equipment as determined by relevant state authority or electrical supply authority.) • traffic (e.g. pedestrians, vehicles, other plant) • insufficient lighting • environmental conditions (e.g. wind, lightning, storms) • other site specific hazards (e.g. hazardous materials).
Hazard control measures:	Refers to the systematic process of eliminating or reducing the risk to personnel and property through the application of controls. It includes the application of the hierarchy of control, the six-step preference of control measures to manage and control risk: • elimination • substitution • isolation • engineering control measures • using safe work practices • personal protective equipment.
Appropriate standards may include:	• codes of practice • legislation • Australian Standards • manufacturer's specifications • industry standards (where applicable).
Site Information may include, but not limited to:	• local conditions such as access and egress • work method statements

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RANGE STATEMENT

	• site-specific job safety analyses and other documentation as required • task plans.
Scaffold may include but not limited to:	• all scaffolds at the basis level • cantilevered and spurred scaffolds • barrow ramps and sloping platforms • tube and coupler scaffolds (including tube and coupler covered ways and gantries) • cantilever loading platforms.
Associated equipment may include but not limited to:	• all associated equipment from basic scaffolding level • independent adjustable props.
Scaffold equipment may include but not limited to:	• all scaffold equipment at the basic level • mast climbers • screen and shutters.
Appropriate personnel may include, but are not limited to:	• supervisors • colleagues • managers who are authorised to take responsibility for the workplace or operations • other scaffolders • other site personnel as applicable.
Safety equipment may include but not limited to:	• safety harness • energy absorber • lanyard • inertia reel.
Forces and Loads may include, but are not limited to:	• dead loads • live loads • static load • dynamic loads • wind loads.
Communication Methods may include but not limited to:	• verbal and non-verbal language • written instructions • signage • communication signals • listening • questioning to confirm understanding, and appropriate worksite protocol.
Procedures may include but not limited to:	• manufacturer's guidelines (instructions, specifications or checklists) • industry operating procedures, relevant codes

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RANGE STATEMENT

	of practice • workplace procedures (work instructions, operating procedures, checklists) • reporting and recording procedures such as e.g. scaffold and scaffold equipment defects.
Communication equipment may include but not limited to:	• fixed frequency two way radios • mobile phones.
Hazard prevention/control measures may include but not limited to:	• safety tags on electrical switches/isolators • safety observer used inside exclusion zone (e.g. Spotter), to include the use of power line warning systems (e.g. Tiger tails) • power disconnected by competent authority where applicable. • traffic and pedestrian barricades and controls • safe and adequate access / egress is established • personal protective equipment • adequate illumination.
Ground suitability may include but not limited to:	• rough uneven ground • backfilled ground • soft soils • hard compacted soil • rock • bitumen • concrete.
Stability may include but not limited to:	• ground bearing pressure • sole plates/boards • screw jacks • levelling • ties/guys.

Unit Sector(s)

Unit sector Construction

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Co-requisite units

Co-requisite units Nil

Functional area

Functional area

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CPCCLSF4001A Licence to erect, alter and dismantle scaffolding advanced level

Modification History

Not Applicable

Unit Descriptor

Unit descriptor

This unit specifies the outcomes required to erect, alter and dismantle scaffolding at the Advanced level. Scaffolding consists of all intermediate scaffolding work including all other scaffolding work connected with the use and operation of Hung scaffolds and Suspended scaffolds for licensing purposes.

Application of the Unit

Application of the unit

This unit covers the scope of work to plan the job, select and inspect equipment, set up task, erect scaffold and scaffold equipment and dismantle scaffold and scaffolding equipment.

This unit is based upon the National Standard for Licensing Persons Performing High Risk Work.

This unit in its current form meets state and territory licensing requirements. Any alteration will result in a unit which is not acceptable to regulators for the purpose of licensing.

This unit has a pre-requisite requirement. This requirement may be met by either the successful completion of the unit *CPCCLSF3001A Licence to erect, alter and dismantle scaffolding intermediate level* or holding a valid licence for intermediate scaffolding.

Licensing/Regulatory Information

Refer to Unit Descriptor

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Pre-Requisites

Prerequisite units

CPCCLSF3001A	Licence to erect, alter and dismantle scaffolding intermediate level

Employability Skills Information

Employability skills This unit contains employability skills.

Elements and Performance Criteria Pre-Content

Elements describe the essential outcomes of a unit of competency.	Performance criteria describe the performance needed to demonstrate achievement of the element. Where bold italicised text is used, further information is detailed in the required skills and knowledge section and the range statement. Assessment of performance is to be consistent with the evidence guide.

Elements and Performance Criteria

ELEMENT	PERFORMANCE CRITERIA
1. Plan job.	1.1. Task to be undertaken is assessed. 1.2. Potential workplace ***hazards*** are identified. 1.3. ***Hazard control measures*** are identified consistent with ***appropriate standards*** to ensure the safety of personnel and equipment. 1.4. Site information is obtained. 1.5. Scaffold, associated equipment and scaffold equipment are identified from site information in consultation with appropriate personnel. 1.6. ***Safety equipment*** is identified. 1.7. All ***forces and loads*** exerted on and by the scaffold

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ELEMENT	PERFORMANCE CRITERIA
	and/or scaffolding equipment are determined and calculated.
	1.8. Appropriate ***communication methods*** are identified with appropriate personnel.
2. Select and inspect equipment.	2.1. Scaffold, associated equipment and scaffold equipment are selected and inspected according to procedures and site information.
	2.2. Safety equipment is selected and inspected according to ***procedures***.
	2.3. All defective scaffold, associated equipment and scaffold equipment are isolated according to procedures.
	2.4. All defective scaffold, associated equipment, scaffold equipment and safety equipment are reported and recorded according to procedures.
	2.5. ***Communication equipment*** is selected and inspected for serviceability (where applicable).
3. Set up task.	3.1. Appropriate ***hazard prevention***/***control measures*** are applied to the work area according to procedures.
	3.2. Scaffold and scaffold equipment are prepared for erection according to procedures.
	3.3. Fit safety equipment and secure according to procedures (where applicable).
4. Erect scaffold and scaffolding equipment.	4.1. Scaffold and scaffold equipment are erected according to procedures and the appropriate standard.
	4.2. Work is conducted safely at heights including safe and effective use of safety equipment.
	4.3. Scaffold and scaffold equipment are erected consistent with site information.
	4.4. Appropriate communication methods are used to coordinate the tasks.
	4.5. Completed tasks are inspected for compliance with the appropriate standard.
	4.6. Handover certificate is completed as required and handed to appropriate personnel.
	4.7. Excess materials from the work area are removed (where applicable).
5. Dismantle scaffold and scaffolding equipment.	5.1. Scaffold and scaffold equipment is dismantled according to procedures and the appropriate standard.

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ELEMENT	PERFORMANCE CRITERIA
	5.2. Work is conducted safely at heights including safe and effective use of safety equipment. 5.3. Scaffold, associated equipment and scaffold equipment are inspected for damage and defects. 5.4. All damaged and defective scaffold, associated equipment and scaffold equipment is tagged and isolated in accordance with procedures. 5.5. Hazard prevention/control measures are removed (where appropriate). 5.6. All damaged and defective scaffold, associated equipment and scaffold equipment are reported and recorded according to procedures and appropriate action taken.

Required Skills and Knowledge

REQUIRED SKILLS AND KNOWLEDGE

This section describes the skills and knowledge required for this unit.

Required skills

Required skills for this unit are:

- ability to erect scaffold and scaffold equipment within the scope of the advanced scaffolder
- ability to erect, level, plumb and stabilise scaffolds and scaffold equipment within the scope of the advanced scaffolder
- ability to work safely at heights
- ability to interpret manufacturer's specifications for plant and equipment
- accurate interpretation of structural charts and structural plans
- correct application of all scaffolding equipment
- verify problems and equipment faults and demonstrate appropriate response.

Required knowledge

Required knowledge for this unit is:

- use of appropriate mathematical procedures for estimation and measurement of loads
- Commonwealth, state or territory OHS legislation and local government regulations, including standards and codes of practice relevant to the full range of techniques for undertaking advanced scaffolding activities

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REQUIRED SKILLS AND KNOWLEDGE

- knowledge of principles relating to plant and equipment stability
- knowledge of types of scaffolding and their application
- knowledge of scaffold and scaffold equipment erection and dismantling techniques
- knowledge of types scaffold and scaffold equipment, associated with advanced scaffolding and their use/s
- risk assessment and control, including understanding of the hierarchy of control
- load capabilities of different types of scaffolding constructions
- understanding and application of organisational and workplace standards, requirements, policies and procedures for scaffolding
- application of safety equipment applicable to scaffolding
- understanding and application of the inspection and maintenance requirements for advanced scaffold, associated equipment and scaffold equipment
- uses and limitations of tools and equipment, appropriate to scaffolding tasks and activities.

Evidence Guide

EVIDENCE GUIDE

The evidence guide provides advice on assessment and must be read in conjunction with the performance criteria, required skills and knowledge, range statement and the Assessment Guidelines for the Training Package.

Overview of assessment	Successful assessment of this unit meets the competency requirement of the National Standard for licensing Persons Performing High Risk Work. State/Territory OHS regulators have mandated the use of Assessment Instruments and Instructions for Assessment endorsed by the national body responsible for OHS matters for the assessment of this unit.
Critical aspects for assessment and evidence required to demonstrate competency in this unit	A person who demonstrates competency in this unit must be able to provide evidence of the ability to: • Effectively communicate and work safely with others in the work area. • Effectively apply risk assessment and hazard management procedures at an advanced scaffolder level.

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EVIDENCE GUIDE

	• Effectively complete the planning, erection and dismantling of scaffolding systems, in accordance with procedures, including a minimum of erection and dismantling of:
	  • a hung scaffold, and
	  • a suspended scaffold.
	
	Hung scaffold means a scaffold that is hung from another structure and that is not capable of being raised or lowered when in use.
	
	Suspended scaffold means a scaffold incorporating a suspended platform that is capable of being raised or lowered when in use.
	
	• Effectively conduct compliance inspections of scaffold and scaffold equipment for advanced scaffolding.
	• Complete handover certificate as required

Context of and specific resources for assessment	• Assessment of the safe and effective application of knowledge and skill to workplace tasks (performance) must be undertaken using the National OHS endorsed Assessment Instrument
	• Assessment of performance must be undertaken either in the workplace or in a realistically simulated workplace setting
	• .Assessors must ensure that the assessment in the workplace is organised to ensure that all the required equipment and materials and a suitable working area is made available to suit the assessment and the workplace
	• Assessment must occur under standard and authorised work practices, safety requirements and environmental constraints for basic scaffolding
	• Applicants must have access to:
	  • personal protective equipment (PPE) for the purpose of the Performance Assessment
	  • appropriate safety equipment in safe condition
	  • appropriate scaffolding and scaffold equipment in safe condition
	  • site information as described in the mandated assessment instrument

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EVIDENCE GUIDE

	• communication equipment (e.g. fixed channel, two-way radios) where applicable • appropriate personnel to assist with the erecting and dismantling of scaffold and scaffold equipment.
Method of assessment	Assessment must be conducted using the national OHS endorsed Assessment Instruments. These Instruments provide advice on their application. Assessment may be in conjunction with the assessment of other units of competency. The use of **'simulators'** in the assessment of this unit of competency is **not acceptable**. Assessment methods must confirm consistency and accuracy of performance together with application of underpinning knowledge. Assessment must confirm a reasonable inference that competency is not only able to be satisfied under the particular circumstance, but is able to be transferred to other circumstances.
Guidance information for assessment	Further information about endorsed Assessment Instruments may be obtained from state/territory OHS regulators.

Range Statement

RANGE STATEMENT

The range statement relates to the unit of competency as a whole. It allows for different work environments and situations that may affect performance. Bold italicised wording, if used in the performance criteria, is detailed below. Essential operating conditions that may be present with training and assessment (depending on the work situation, needs of the candidate, accessibility of the item, and local industry and regional contexts) may also be included.

Hazards may include but not limited to:	• overhead hazards (e.g. power lines, service pipes) (minimum clearance distance from powerlines or electrical equipment as determined by relevant state authority or electrical supply authority)

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RANGE STATEMENT

	• traffic (e.g. pedestrians, vehicles, other plant) • insufficient lighting • environmental conditions (e.g. wind, lightning, storms) • other site specific hazards (e.g. hazardous materials).
Hazard control measures:	Refers to the systematic process of eliminating or reducing the risk to personnel and property through the application of controls. It includes the application of the hierarchy of control, the six-step preference of control measures to manage and control risk: • elimination • substitution • isolation • engineering control measures • using safe work practices • personal protective equipment.
Appropriate standards may include:	• codes of practice • legislation • Australian Standards • manufacturer's specifications • industry standards (where applicable).
Site Information may include, but not limited to:	• local conditions such as access and egress • work method statements • site-specific job safety analyses and other documentation as required.
Scaffold may include but not limited to:	• all scaffold at the basis and intermediate levels • hung scaffolds, including scaffolds hanging from tubes, wire ropes or chains • suspended scaffolds.
Associated equipment may include but not limited to:	• all associated equipment at the basic and intermediate levels • counterweights • prefabricated needles.
Scaffolding equipment may include but not limited to:	• all scaffold equipment at the basis and intermediate level • swinging stages.
Appropriate personnel may	• supervisors

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RANGE STATEMENT

include, but is not limited to:	• colleagues • managers who are authorised to take responsibility for the workplace or operations • other scaffolders • other site personnel as applicable.
Safety equipment may include but is not limited to:	• safety harness • energy absorber • lanyard • inertia reel.
Forces and Loads may include, but are not limited to:	• dead loads • live loads • static load • dynamic loads • wind loads.
Communication Methods may include but are not limited to:	• verbal and non-verbal language • written instructions • signage • communication signals • listening • questioning to confirm understanding, and appropriate worksite protocol.
Procedures may include but are not limited to:	• manufacturer's guidelines (instructions, specifications or checklists) • industry operating procedures, relevant codes of practice • workplace procedures (work instructions, operating procedures, checklists) • reporting and recording procedures such as e.g. equipment defect/s.
Communication equipment may include but is not limited to:	• fixed frequency radios • mobile phones.
Hazard prevention/control measures may include but are not limited to:	• safety tags on electrical switches/isolators • safety observer used inside exclusion zone (e.g. Spotter), to include the use of power line warning systems (e.g. Tiger tails) • power disconnected by competent authority where applicable. • traffic and pedestrian barricades and controls • safe and adequate access / egress is established

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RANGE STATEMENT

- personal protective equipment
- adequate illumination.

Unit Sector(s)

Unit sector Construction

Co-requisite units

Co-requisite units Nil

Functional area

Functional area

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CPCCOHS2001A Apply OHS requirements, policies and procedures in the construction industry

Modification History

Not Applicable

Unit Descriptor

Unit descriptor This unit of competency specifies the outcomes required to carry out OHS requirements through safe work practices at any on or off-site construction workplace. It requires the performance of work in a safe manner through awareness of risks and work requirements, and the planning and performance of safe work practices with concern for personal safety and the safety of others.

Application of the Unit

Application of the unit This unit of competency covers fundamental OHS necessary to undertake work tasks within any sector in the construction industry. It includes the identification of hazardous materials, including asbestos, and compliance with legislated work safety practices. It does not cover removal of asbestos, which is a licensed activity.

The unit relates directly to the general induction training program specified by the *National Code of Practice for Induction for Construction Work* (ASCC 2007) required to enter a construction work site. Completion of unit CPCCOHS1001A covers this requirement.

Licensing/Regulatory Information

Not Applicable

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Pre-Requisites

Prerequisite units Nil

Employability Skills Information

Employability skills This unit contains employability skills.

Elements and Performance Criteria Pre-Content

Elements describe the essential outcomes of a unit of competency.	Performance criteria describe the performance needed to demonstrate achievement of the element. Where bold italicised text is used, further information is detailed in the required skills and knowledge section and the range statement. Assessment of performance is to be consistent with the evidence guide.

Elements and Performance Criteria

ELEMENT	PERFORMANCE CRITERIA
1. Identify and assess risks.	1.1. ***Hazards*** in the work area are identified, assessed and reported to ***designated personnel***. 1.2. Safety risks in the work area are identified, assessed and reported to designated personnel. 1.3. ***Safe work practices***, ***duty of care*** requirements and safe work instructions are followed for controlling risks. 1.4. OHS, hazard, accident or ***incident*** reports are contributed to according to workplace procedures and ***Australian government and state or territory OHS legislation*** and relevant ***information***.
2. Identify hazardous materials and other	2.1. ***Hazardous materials*** on a work site are correctly identified and, if appropriate, handled and used

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ELEMENT	PERFORMANCE CRITERIA
hazards on work sites.	according to company and legislated procedures. 2.2. ***Measures for controlling risks*** and construction hazards are applied effectively and immediately. 2.3. Hazardous materials that have safety implications for self and other workers are secured immediately they are identified, using appropriate ***signs and symbols***. 2.4. Asbestos-containing materials are identified on a work site and reported to designated personnel.
3. Plan and prepare for safe work practices.	3.1. Correct ***personal protective equipment*** and clothing for each area of construction work are identified, worn, correctly fitted, used and stored according to enterprise procedures. 3.2. Selection of ***tools***, ***equipment*** and ***materials***, and organisation of tasks are performed in conjunction with other personnel on site and in accordance with enterprise procedures. 3.3. Required barricades and signage are determined and erected at the appropriate site location. 3.4. Material safety data sheets (MSDS), and job safety analysis (JSA) and safe work method statements relevant to the work to be carried out are identified and applied.
4. Apply safe work practices.	4.1. Tasks are performed in a manner that is safe for operators, other personnel and the general community in accordance with legislative requirements, and enterprise policies and procedures. 4.2. Plant and equipment guards are used in accordance with manufacturer specifications, work site regulations and Australian standards where applicable. 4.3. Procedures and relevant authorities for reporting hazards, incidents and injuries are used. 4.4. ***Prohibited tools and equipment*** in areas with identified asbestos are recognised and not used. 4.5. Work site safety signs and symbols are identified and followed. 4.6. Work site area is cleared and maintained to prevent and protect self and others from incidents and accidents and to meet ***environmental requirements***.
5. Follow emergency procedures.	5.1. Designated personnel are identified in the event of an emergency for communication purposes. 5.2. Safe workplace procedures for dealing with accidents,

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ELEMENT	PERFORMANCE CRITERIA
	various ***types of fire*** and other emergencies are followed, including identification or use, if appropriate, of ***fire equipment*** within scope of responsibilities.
	5.3. ***Emergency response and evacuation procedures*** are known, practised and carried out effectively when required.
	5.4. Emergency first aid treatment of minor injuries is carried out correctly and details of any treatment administered are reported accurately to designated personnel as soon as possible.

Required Skills and Knowledge

REQUIRED SKILLS AND KNOWLEDGE

This section describes the skills and knowledge required for this unit.

Required skills

Required skills for this unit are:

- ability to accurately recognise OHS hazards, including asbestos and take all opportunities to alleviate safety problems in a variety of construction work sites and environments
- capacity to deal calmly and effectively with any potential safety problems and work closely with other team members and supervisors to ensure safe working conditions are maintained
- communication skills to:
  - determine and report hazards and risks
  - enable clear and direct communication, using questioning to identify and confirm requirements, share information, listen and understand
  - follow instructions
  - read and interpret:
    - MSDS, JSA and safe work method statements
    - other relevant documentation
  - use language and concepts appropriate to cultural differences
  - use and interpret non-verbal communication, such as hand signals
  - written skills to contribute to reports
- identifying and accurately reporting to appropriate personnel any faults in tools, equipment or materials

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REQUIRED SKILLS AND KNOWLEDGE

- organisational skills, including the ability to plan and set out work
- teamwork skills to work with others to action tasks and relate to people from a range of cultural and ethnic backgrounds and with varying physical and mental abilities
- technological skills to:
  - use a range of mobile technology, such as two-way radio and mobile phones
  - voice and hand signals to access and understand site-specific instructions.

Required knowledge

Required knowledge for this unit is:

- asbestos management code prevention of exposure
- basic first aid procedures
- common construction industry terminology
- common workplace safety hazards and risks and procedures for reporting these to designated personnel
- construction industry communications equipment and use
- construction industry health and safety signage
- emergency response and evacuation procedures
- JSA and safe work method statements
- MSDS
- OHS hierarchy of control and role of OHS committees and representatives
- relevant legislation, regulations and workplace requirements relating to OHS, including hazard reduction and personal safety, including duty of care responsibilities, workers' compensation and injury management requirements
- safe manual handling techniques
- safe work practices in normal working environment
- safety equipment, policies and requirements for working in confined spaces and at height, including on rooves
- tools and equipment prohibited for use near identified asbestos-containing materials (ACM)
- types of fires and basic firefighting equipment
- types, possible location and risks of ACM, including serpentine and amphibole groups, and their use in common building materials
- types, purpose and use of construction industry personal protective equipment and clothing
- workplace and equipment safety requirements.

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Evidence Guide

EVIDENCE GUIDE

The evidence guide provides advice on assessment and must be read in conjunction with the performance criteria, required skills and knowledge, range statement and the Assessment Guidelines for the Training Package.

Overview of assessment

This unit of competency could be assessed in the workplace or a close simulation of the workplace environment, provided that simulated or project-based assessment techniques fully replicate construction workplace conditions, materials, activities, responsibilities and procedures.

Critical aspects for assessment and evidence required to demonstrate competency in this unit

A person who demonstrates competency in this unit must be able to provide evidence of the ability to:

- correctly locate, interpret and apply relevant information, standards and specifications
- comply with a site safety plan, organisational policies, OHS regulations and state and territory legislation applicable to workplace operations, including quality requirements
- correctly identify ACM and policies and procedures for reporting this to designated personnel
- effectively communicate and work safely with others
- apply general procedures for responding to incidents and reporting hazards and injuries
- select and use firefighting equipment to extinguish a simulated mechanical fire
- evacuate a site through simulated response to an emergency, complying with workplace procedures.

Context of and specific resources for assessment

This competency is to be assessed using standard and authorised work practices, safety requirements and environmental constraints.

Assessment of essential underpinning knowledge will usually be conducted in an off-site context.

Assessment is to comply with relevant regulatory or Australian standards' requirements.

Resource implications for assessment include:

- an induction procedure and requirement
- realistic tasks or simulated tasks covering the mandatory task requirements

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EVIDENCE GUIDE

- relevant specifications and work instructions
- tools and equipment appropriate to applying safe work practices
- support materials appropriate to activity
- workplace instructions relating to safe work practices and addressing hazards and emergencies
- material safety data sheets
- research resources, including industry related systems information.

Reasonable adjustments for people with disabilities must be made to assessment processes where required. This could include access to modified equipment and other physical resources, and the provision of appropriate assessment support.

Method of assessment

Assessment methods must:

- satisfy the endorsed Assessment Guidelines of the Construction, Plumbing and Services Training Package
- include direct observation of tasks in real or simulated work conditions, with questioning to confirm the ability to consistently identify and correctly interpret the essential underpinning knowledge required for practical application
- reinforce the integration of employability skills with workplace tasks and job roles
- confirm that competency is verified and able to be transferred to other circumstances and environments.

Validity and sufficiency of evidence requires that:

- competency will need to be demonstrated over a period of time reflecting the scope of the role and the practical requirements of the workplace
- where the assessment is part of a structured learning experience the evidence collected must relate to a number of performances assessed at different points in time and separated by further learning and practice, with a decision on competency only taken at the point when the assessor has complete confidence in the person's demonstrated ability and applied knowledge
- all assessment that is part of a structured learning experience must include a combination of direct,

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	indirect and supplementary evidence. Assessment processes and techniques should as far as is practical take into account the language, literacy and numeracy capacity of the candidate in relation to the competency being assessed. Supplementary evidence of competency may be obtained from relevant authenticated documentation from third parties, such as existing supervisors, team leaders or specialist training staff.

Range Statement

RANGE STATEMENT

The range statement relates to the unit of competency as a whole. It allows for different work environments and situations that may affect performance. Bold italicised wording, if used in the performance criteria, is detailed below. Essential operating conditions that may be present with training and assessment (depending on the work situation, needs of the candidate, accessibility of the item, and local industry and regional contexts) may also be included.

Hazards include:

- chemical spills
- electrical safety work in confined spaces
- excavations, including trenches
- falling objects
- fires
- gases
- hazardous materials
- high or very low temperatures
- HIV and other infectious diseases
- liquids under pressure
- manual handling
- moving machinery and equipment
- noise, dust and vapours
- overhanging beams
- protrusions
- sharp equipment
- traffic
- ultraviolet (UV) radiation
- unplanned collapse

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RANGE STATEMENT

	• working at heights.
Designated personnel to be contacted in case of an emergency, accident, fire or to report a risk such as identification of ACM are:	• designated safety officers, determined by the enterprise, who have undertaken specific safety response training • managers or other senior personnel • personnel competent and/or licensed in the safe handling of asbestos • supervisors.

Safe work practices:	• include:
	  • day to day observation of OHS policies and procedures
	  • emergency procedures
	  • risk assessment
	  • use of basic firefighting equipment
	• relate to:
	  • access to site amenities, such as drinking water and toilets
	  • general requirements for safe use of plant and equipment
	  • general requirements for use of personal protective equipment and clothing
	  • housekeeping to ensure a clean, tidy and safer work area
	  • no drugs and alcohol at work
	  • preventing bullying and harassment
	  • smoking in designated areas
	  • storage and removal of debris.

Duty of care requirements:	• relate to:
	  • legal responsibility under duty of care to do everything reasonably practicable to protect others from harm
	  • relevant state and territory OHS requirements and include employers and self-employed persons, persons in control of the work site, construction supervisors, designers, manufacturers and suppliers, construction workers, subcontractors and inspectors
	• may relate to:
	  • own responsibilities to comply with safe work practices, including activities that

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RANGE STATEMENT

	require licences, tickets or certificates of competency.

Incidents include:	• accidents resulting in personal injury or damage to property
	• near misses or dangerous occurrences that do not cause injury but may pose an immediate and significant risk to persons or property, and need to be reported so that action can be taken to prevent recurrence, for example:
	  • breathing apparatus malfunctioning to the extent that the user's health is in danger
	  • collapse of the floor, wall or ceiling of a building being used as a workplace
	  • collapse or failure of an excavation more than 1.5 metres deep (including any shoring)
	  • collapse or partial collapse of a building or structure
	  • collapse, overturning or failure of the load bearing of any scaffolding, lift, crane, hoist or mine-winding equipment
	  • damage to or malfunction of any other major plant
	  • electric shock
	  • electrical short circuit, malfunction or explosion
	  • uncontrolled explosion, fire or escape of gas, hazardous substance or steam
	  • any other unintended or uncontrolled incident or event arising from operations carried on at a workplace.

Australian government and state or territory OHS legislative requirements include:	• Australian standards • construction industry OHS standards and guidelines • duty of care • health and safety representatives, committees and supervisors • JSA and safe work method statements • licences, tickets or certificates of competency • National Code of Practice for Induction Training for Construction Work • national safety standards

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RANGE STATEMENT

	• OHS and welfare Acts and regulations • safety codes of practice.
Information includes:	• diagrams or sketches • emergency situation contacts • evacuation plans • instructions issued by authorised organisational or external personnel • labels • manufacturer specifications and instructions • memos • MSDS • organisation work specifications and requirements • plans and specifications • regulatory and legislative requirements, such as Acts, regulations and codes of practice • relevant Australian standards • reports of near misses or accidents • safe work procedures or equivalent documentation • safety meeting minutes • signage • verbal or written and graphical instructions • work bulletins • work schedules.
Hazardous materials include:	• ACM • cleaning chemicals, including those in pressurised containers • glues • insulation materials • solvents • treated timber products.
Measures for controlling risk or minimising hazards in accordance with the hierarchy of control include:	• elimination • substitution • isolation • engineering control • administrative control • personal protective equipment.
Signs and symbols include:	• emergency information signs (exits, equipment, first aid) • fire signs (location of fire alarms and

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	firefighting equipment) • hazard identification, facility or location signs • regulatory signs (e.g. prohibition, mandatory and limitation or restriction), such as hazard signs (danger and warning) • safety tags and lockout (danger tags, out of service tags) • site safety, directional, traffic and warning signs and symbols.
Asbestos-containing materials are identified:	• includes recognising common types of ACM that may be found in construction materials and buildings • covers asbestos rope/fabrics, asbestos cement sheeting, asbestos cement piping and lagging on pipes, bituminous waterproof membrane, fire doors, electrical switchboards, millboard, and sheeting under ceramic or vinyl floor tiles in wet areas.
Asbestos-containing materials are ***reported*** to:	• person in control of the workplace as set out in the relevant Asbestos Management Code.
Personal protective equipment is to include:	• aprons • arm guards • caps • dust mask/respirators • ear muffs/plugs • gloves • hard hats • high visibility retro reflective vests • jackets • overalls • safety glasses/goggles • steel capped boots • UV protective clothing and sunscreen.
Tools and equipment include:	• firefighting equipment • first aid kit • ladders and work platforms • personal protective equipment.
Materials include:	• first aid materials suitable for emergency first aid treatment of minor injuries.
Prohibited tools and equipment that cannot be used near identified	• high-speed abrasive power and pneumatic tolls, high pressure water cleaners, compressed

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RANGE STATEMENT

ACM include:	air or abrasive blasting • any vacuum cleaning equipment not specifically designed for safe work with asbestos.
Environmental requirements are to cover workplace quality management and include:	• clean-up protection • stormwater protection • waste management.
Types of fire includes:	• electrical, chemical, gas, mechanical, paper, wood or natural fire.
Fire equipment includes:	• breathing apparatus • fire extinguishers • fire hydrant and hoses • fire reel • fire truck • manual firefighting instruments, such as fire blankets.
Emergency response and evacuation procedures include:	• emergencies, such as fire, toxic and/or flammable vapours emission, vehicle/mobile plant accident, structural collapse, chemical spill and injury to personnel • extinguishing fires, organisational first aid requirements and evacuation.

Unit Sector(s)

Unit sector Construction

Co-requisite units

Co-requisite units Nil

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Functional area

Functional area

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CPCCWHS1001 Prepare to work safely in the construction industry

Modification History

Release	Comment
Version 1	Replaces superseded equivalent CPCCOHS1001A Work safely in the construction industry.

Application

This unit of competency specifies the mandatory work health and safety training required prior to undertaking construction work. The unit requires the person to demonstrate personal awareness and knowledge of health and safety legislative requirements in order to work safely and prevent injury or harm to self and others. It covers identifying and orally reporting common construction hazards, understanding basic risk control measures, and identifying procedures for responding to potential incidents and emergencies. It also covers correctly selecting and fitting common personal protective equipment (PPE) used for construction work.

This unit meets the general construction induction training requirements of:

- Part 1.1 Definitions and Part 6.5 of the Model Work Health and Safety Regulations;
- Division 11 of Part 3 of the Occupational Safety and Health Regulations 1996 for Western Australia; and
- Division 3 of Part 5.1 of the Occupational Health and Safety Regulations 2007 for Victoria.

It is expected that site-specific induction training will be conducted prior to conducting construction work.

Licensing, legislative, regulatory or certification requirements apply to this unit. Relevant work health and safety state and territory regulatory authorities should be consulted to confirm jurisdictional requirements.

Pre-requisite Unit

Nil

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Unit Sector

Construction

Elements and Performance Criteria

Elements describe the essential outcomes.		Performance criteria describe the performance needed to demonstrate achievement of the element. Where bold italicised text is used, further information is detailed in the range of conditions.
1.	Identify health and safety legislative requirements of construction work.	1.1. Basic roles, responsibilities and rights of duty holders are identified and explained according to ***jurisdictional health and safety legislative requirements***.
		1.2. Duty of care requirements are identified.
		1.3. Construction safe work practices are identified and explained.
2.	Identify construction hazards and risk control measures.	2.1. Basic principles of risk management are identified.
		2.2. Construction hazards are identified and discussed.
		2.3. Purpose and use of PPE are identified and demonstrated.
		2.4. Measures for controlling hazards are identified.
3.	Identify health and safety communication and reporting processes.	3.1. Health and safety documents are identified and discussed.
		3.2. Roles of designated health and safety personnel are identified and explained.
		3.3. Safety signs and symbols are identified and explained.
		3.4. Procedures for reporting hazards, incidents and injuries are identified.
4.	Identify incident and emergency response	4.1. Procedures for responding to incidents and emergencies are identified and explained.
		4.2. Procedures for accessing first aid are identified.

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procedures.	4.3.	Types and purpose of fire safety equipment are identified and discussed.

Foundation Skills

This section describes the language, literacy, numeracy and employment skills essential to performance in this unit but not explicit in the performance criteria.

Skill	Performance feature
Numeracy skills to:	• locate and recognise numbers commonly used in safety signs.
Oral communication skills to:	• ask questions to clarify instructions • listen to instructions to identify key safety information • tell another person about a construction problem or hazard.
Reading skills to:	• follow simple pictorial safety instructions • follow simple safety instructions that are written in English.
Problem-solving skills to:	• select risk control measures.

Range of Conditions

This section specifies work environments and conditions that may affect performance. Essential operating conditions that may be present (depending on the work situation, needs of the candidate, accessibility of the item, and local industry and regional contexts) are included. Bold italicised wording, if used in the performance criteria, is detailed below.

Jurisdictional health and safety legislative requirements must include at least one of the following state and territory Acts or their equivalent:	• Australian Capital Territory: Work Health and Safety Act 2011 • New South Wales: Work Health and Safety Act 2011 • Northern Territory: Work Health and Safety (National Uniform Legislation) Act 2011 • Queensland: Work Health and Safety Act 2011 • South Australia: Work Health and Safety Act 2012 • Tasmania: Work Health and Safety Act 2012 • Victoria: Occupational Health and Safety Act 2004 • Western Australia: Occupational Safety and Health Act 1984.

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Unit Mapping Information

Supersedes and is equivalent to CPCCOHS1001A Work safely in the construction industry

Links

Companion Volume implementation guides are found in VETNet - https://vetnet.gov.au/Pages/TrainingDocs.aspx?q=7e15fa6a-68b8-4097-b099-030a5569b1ad

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Assessment Requirements for CPCCWHS1001 Prepare to work safely in the construction industry

Modification History

Release	Comment
Version 1	Replaces superseded equivalent CPCCOHS1001A Work safely in the construction industry.

Performance Evidence

A person demonstrating competency in this unit must satisfy the requirements of the elements, performance criteria, foundation skills, and range of conditions of this unit, in addition to the specific performance and knowledge evidence described below.

The person must:

- identify and orally report two construction hazards
- orally explain how risk could be reduced or removed in relation to those two hazards
- select appropriate personal protective equipment (PPE) to control the risk
- orally explain basic procedures for responding to incidents and emergencies, including types and purpose of the following fire safety equipment:
  - fire blankets
  - fire extinguishers, including water, carbon dioxide, powder and foam
  - hose reels and mains
- identify and orally explain the meaning of required safety signs and symbols
- orally explain the purpose of job safety analyses (JSAs), safe work method statements (SWMS) and safety data sheets (SDS)
- orally explain the roles of the following designated health and safety personnel:
  - first aid officers
  - work health and safety representatives
  - work health and safety committee members
  - supervisors.

The person must also demonstrate correctly fitting to themselves the PPE listed below:

- eye protection
- hearing protection
- hard hat

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- high visibility retro reflective vest.

Knowledge Evidence

A person must demonstrate knowledge of:

- basic duty of care, and the roles, rights and responsibilities of business owners and workers in relation to working safely while undertaking construction work
- basic meaning of the terms ‘hazard’ and ‘risk’
- basic principles of risk management, including the following five steps in order:
  - identify hazard
  - assess risk
  - consult and report
  - control hazard
  - review
- basic procedures for accessing first aid
- construction hazards, including those relating to:
  - asbestos
  - confined spaces
  - electrical: power lines, cords and equipment
  - excavations and trenches, including underground services
  - dust
  - falling objects
  - hazardous substances and dangerous goods
  - hot and cold work environments
  - manual handling
  - noise
  - plant and equipment operation
  - traffic and mobile plant
  - unplanned collapse
  - ultraviolet radiation
  - working at heights, including scaffolding
- construction work that requires a high risk work licence
- types, purpose and use of PPE used in construction, as specified in the performance evidence, and including safety footwear, harnesses and respiratory protection, and ultraviolet (UV) protective clothing and sunscreen
- construction emergencies, including:
  - chemical spill
  - fire
  - injury to personnel
  - structural collapse
  - toxic or flammable vapour emission

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    - vehicle or mobile plant accident
- construction incidents, including:
    - incidents resulting in personal injury or damage to property
    - near misses or dangerous occurrences that do not cause injury but may pose an immediate and significant risk to persons or property, and need to be reported so that action can be taken to prevent recurrence
- safe work practices that should be followed in construction work, including:
    - accessing and using site amenities for drinking water, hand washing and toilets
    - following safety procedures when performing work tasks and using equipment
    - identifying and reporting hazards, incidents and injuries in the workplace
    - keeping the work area clean, tidy and free from debris
    - not using or being affected by drugs and/or alcohol while at work
    - preventing bullying and harassment in the workplace
    - selecting and using required PPE
    - smoking only in designated areas
    - storing and removing waste and debris in designated areas
- meanings and symbols associated with construction safety signs, symbols and tags, including:
    - emergency information signs: exits, emergency equipment and first aid
    - fire signs: location of fire alarms and firefighting equipment
    - hazard signs and symbols: danger and warning
    - regulatory signs and symbols: prohibition, mandatory and limitation or restriction
    - safety and lockout tags: danger and out-of-service tags.

Assessment Conditions

The following must be present and available to learners during assessment activities:

- equipment:
    - all of the PPE listed in the performance evidence
- specifications:
    - state or territory Act relevant to the location of the learner, as specified in the range of conditions.

The assessment of performance evidence must be done by direct observation of the learner by an assessor, either by an assessor observing the learner physically and/or by an assessor observing the learner via audio and visual media in real time.

Assessor requirements

As a minimum, assessors must satisfy the assessor requirements in the Standards for Registered Training Organisations (RTOs) current at the time of assessment.

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Assessors must hold the unit *CPCCOHS2001A Apply OHS requirements, policies and procedures in the construction industry*, or its successor.

Links

Companion Volume implementation guides are found in VETNet - https://vetnet.gov.au/Pages/TrainingDocs.aspx?q=7e15fa6a-68b8-4097-b099-030a5569b1ad

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FDFSUG222A Operate a waste water treatment system

Modification History

New Unit based on *SUGPWWT2A Operate a waste water treatment system*.

Unit Descriptor

This unit describes the outcomes required to operate waste water treatment systems to comply with workplace requirements, trade waste agreements and site environmental authority.

Application of the Unit

This unit has application in the sugar milling industry.

Licensing/Regulatory Information

Not applicable.

Pre-Requisites

There are no pre-requisite units for this competency standard.

Employability Skills Information

This unit contains employability skills.

Elements and Performance Criteria Pre-Content

Elements describe the essential outcomes of a unit of competency.	Performance criteria describe the performance needed to demonstrate achievement of the element. Where bold italicised text is used, further information is detailed in the required skills and knowledge section and the range statement. Assessment of performance is to be consistent with the evidence guide.

Elements and Performance Criteria

ELEMENT	PERFORMANCE CRITERIA
1 Prepare the waste water treatment	1.1 Chemicals and test equipment are available and ready for use

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ELEMENT	PERFORMANCE CRITERIA
process for operation	1.2 Services are confirmed as available and ready for operation
	1.3 Pre-operational checks are conducted
	1.4 Instrumentation and test equipment is calibrated to manufacturer's specifications to meet workplace requirements
	1.5 Health and safety hazards/maintenance requirements are identified and reported to appropriate personnel according to workplace reporting procedures
2 Operate and monitor the waste water treatment process	2.1 The waste water system is started up according to company procedures
	2.2 Plant is operated within limits of manufacturer's specifications to meet workplace requirements
	2.3 Equipment is monitored to confirm operating condition
	2.4 Waste water quality is monitored, tested and adjusted as required to meet water standards as defined by site licence
	2.5 First flush systems are operated during rainfall events
	2.6 The workplace meets housekeeping standards
3 Analyse and respond to abnormal performance	3.1 Water condition and plant operating conditions are analysed to identify causes of abnormal performance
	3.2 Corrective action is taken in accordance with workplace procedures in response to hazards, out-of-specification test results and/or plant performance
	3.3 Emergency procedures are implemented as required according to workplace procedures and manufacturer's recommendations
4 Handover waste water treatment system	4.1 Workplace records are maintained in accordance with statutory requirements and workplace procedures
	4.2 Handover is carried out according to workplace procedure
	4.3 Waste water treatment operators are aware of system status and related equipment at completion of handover
5 Shutdown the waste water treatment system	5.1 The waste water treatment system is shut down according to workplace procedures
	5.2 The waste water treatment system is prepared for storage in shut down mode
	5.3 Maintenance requirements are identified and reported according to workplace reporting procedure

Required Skills and Knowledge

This section describes the skills and knowledge required for this unit.

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Required skills include:

Ability to:

- access workplace information to identify waste treatment requirements
- select, fit and use personal protective clothing and/or equipment
- confirm services are available and equipment is clean and ready for operation
- handle chemicals safely including follow correct preparation, handling and storage procedures and use of appropriate protective clothing and equipment
- conduct pre-start checks
- liaise with other work areas as required
- demonstrate wastewater system operating procedures in both manual and automatic modes
- demonstrate first flush system operating procedures in both manual and automatic modes
- monitor waste water system operation including monitoring:
  - chemical addition rates and residuals
  - temperatures
  - flow rates
  - equipment condition including calibration of instruments
  - tests as required
  - dissolved oxygen levels
  - pH levels
- conduct water quality tests
- take corrective action in response to out-of-specification results or non-compliance
- monitor supply and quality of waste water to and from the process
- report and/or record corrective action as required
- demonstrate emergency procedures to control chemical spills or other major incidents relevant to the workplace
- demonstrate shift handover procedure
- demonstrate an operational shut down procedure
- maintain workplace records to meet the requirements of the workplace and site environmental authority
- maintain work area to meet housekeeping standards

Required knowledge includes:

Knowledge of:

- relevant state OHS legislation, environmental acts and policies, standards and codes of practice relating to work responsibilities including awareness of standards set out in site license arrangements
- safe work procedures including awareness of health and safety hazards related to waste water system operation and associated control measures
- hierarchy of hazard control measures
- purpose and limitations of protective clothing and equipment
- methods used to render equipment safe to inspect, maintain and/or clean including lock-out,

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tag-out and isolation procedures
- water cycles for trade waste, storm water and sewerage including sources and flow patterns
- purpose and standards required by environmental agreements and responsibilities
- company policy relating to environmental performance
- consequences of non-conformance
- waste characteristics and treatment methods
- sampling and test procedures as appropriate
- purpose of chemicals used
- purpose of first flush systems and their relationship with the wastewater treatment system
- operating requirements and parameters
- water quality sampling and test procedures including the purpose of test and safe use, care and storage of relevant test equipment, interpretation and recording of results
- typical causes of non-conforming water quality and corrective action required
- equipment purpose and basic operating principles of waste water treatment equipment and methods
- requirements of both operational and long term shut down conditions to ensure the equipment is left in a safe state for the period of the shutdown and to minimise any delays in future start up
- housekeeping standards for the work area
- reporting and recording systems including both statutory and workplace requirements

Evidence Guide

The evidence guide provides advice on assessment and must be read in conjunction with the performance criteria, required skills and knowledge, range statement and the Assessment Guidelines for the Training Package.	
Overview of assessment	Assessment must be carried out in a manner that recognises the cultural and literacy requirements of the assessee and is appropriate to the work performed.
Critical aspects for assessment and evidence required to demonstrate competency in this unit	Evidence of ability to: • handle chemicals safely • demonstrate wastewater system operating procedures • demonstrate first flush system operating procedures • conduct water quality tests • take corrective action in response to out-of-specification results or non-compliance • monitor supply and quality of waste water • report and/or record corrective action • demonstrate emergency procedures • demonstrate shift handover procedure

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	• demonstrate an operational shut down procedure.
Context of and specific resources for assessment	Assessment must occur in a real or simulated workplace where the assessee has access to: • Waste water treatment systems and related chemicals • Test equipment • Relevant advice on environmental agreements • Operating procedures and related advice on equipment operation • Personal protective clothing and equipment • Communication systems and equipment • Housekeeping standards and procedures • Workplace information recording systems, requirements and procedures.
Method of assessment	Other units of competency relevant to the work role should be assessed in conjunction with this unit.
Guidance information for assessment	To ensure consistency in one's performance, competency should be demonstrated on more than one occasion over a period of time in order to cover a variety of circumstances, cases and responsibilities, and where possible, over a number of assessment activities.

Range Statement

The range statement relates to the unit of competency as a whole. It allows for different work environments and situations that may affect performance. Bold italicised wording, if used in the performance criteria, is detailed below. Essential operating conditions that may be present with training and assessment (depending on the work situation, needs of the candidate, accessibility of the item, and local industry and regional contexts) may also be included.	
Policies and procedures	Work is carried out in accordance with company policies and procedures, manufacturer's recommendations, legislative requirements, site licenses and trade waste service agreements and industrial awards and agreements. Legislation refers to environmental acts and regulations.
Workplace information	Workplace information can include: • Standard Operating Procedures (SOPs) • manufacturer's specifications
Equipment	Equipment may include

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	• screens • pH correction • oil/grease skimmers • settling and treatment ponds • aeration units • lagoons • first flush systems and wetlands • pumps and valves.
Equipment status	Confirming equipment status involves • conducting relevant pre-start checks • confirming that housekeeping standards are met • all safety guards are in place • equipment is operational.
Hazards	Hazards typically include handling chemicals, manual handling and flammable gases.
Equipment operation and monitoring	Operation and monitoring of equipment and processes typically requires the use of control panels and systems.
Tests	Typical tests may include • pH • solids • colour/turbidity • flow rate • settling rate • settled volume • DO • BOD/COD levels.
Teamwork	Work may require the ability to work within a team environment.
Information systems	Information systems may be print or screen based.

Unit Sector(s)

Sugar Milling.

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HLTAID001 Provide cardiopulmonary resuscitation

Modification History

Release	Notes
Release 5	Updated: • assessor requirements statement • foundation skills lead in statement • licensing statement • modification history to reflect 2012 standards Equivalent outcome.
Release 4	Updated mapping information. Changes to assessment requirements. Equivalent outcome.
Release 3	Updated mapping information. Equivalent outcome.
Release 2	Updated mapping information. Equivalent outcome.
Release 1	This version was released in *HLT Health Training Package release 1.0* and meets the requirements of the 2012 Standards for Training Packages. Significant changes to elements and performance criteria. Revised evidence requirements, including volume and frequency of assessment.

Application

This unit describes the skills and knowledge required to perform cardiopulmonary resuscitation (CPR) in line with the Australian Resuscitation Council (ARC) Guidelines.

This unit applies to all workers who may be required to provide CPR, in a range of situations, including community and workplace settings.

Specific licensing /regulatory requirements relating to this competency, including requirements for refresher training should be obtained from the relevant national/state/territory Work Health and Safety Regulatory Authorities.

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Elements and Performance Criteria

ELEMENT	PERFORMANCE CRITERIA
Elements define the essential outcomes.	*Performance criteria specify the level of performance needed to demonstrate achievement of the element.*
1. Respond to an emergency situation	1.1 Recognise an emergency situation 1.2 Identify, assess and minimise immediate hazards to health and safety of self and others 1.3 Assess the casualty and recognise the need for CPR 1.4 Seek assistance from emergency response services
2. Perform CPR procedures	2.1 Perform cardiopulmonary resuscitation in accordance with ARC guidelines 2.2 Display respectful behaviour towards casualty 2.3 Operate automated external defibrillator (AED) according to manufacturer's instructions
3. Communicate details of the incident	3.1 Accurately convey incident details to emergency response services 3.2 Report details of incident to workplace supervisor as appropriate 3.3 Maintain confidentiality of records and information in line with statutory and/or organisational policies

Foundation Skills

The Foundation Skills describe those required skills (language, literacy, numeracy and employment skills) that are essential to performance.

Foundation skills essential to performance are explicit in the performance criteria of this unit of competency.

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Unit Mapping Information

No equivalent unit.

Links

Companion Volume implementation guides are found in VETNet - https://vetnet.gov.au/Pages/TrainingDocs.aspx?q=ced1390f-48d9-4ab0-bd50-b015e5485705

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Assessment Requirements for HLTAID001 Provide cardiopulmonary resuscitation

Modification History

Release	Notes
Release 5	Updated: • assessor requirements statement • foundation skills lead in statement • licensing statement • modification history to reflect 2012 standards Equivalent outcome.
Release 4	Updated mapping information. Changes to assessment requirements. Equivalent outcome.
Release 3	Updated mapping information. Equivalent outcome.
Release 2	Updated mapping information. Equivalent outcome.
Release 1	This version was released in *HLT Health Training Package release 1.0* and meets the requirements of the 2012 Standards for Training Packages. Significant changes to elements and performance criteria. Revised evidence requirements, including volume and frequency of assessment.

Performance Evidence

The candidate must show evidence of the ability to complete tasks outlined in elements and performance criteria of this unit, manage tasks and manage contingencies in the context of the job role.

There must be evidence that the candidate has completed the following tasks in line with state/territory regulations, first aid codes of practice, Australian Resuscitation Council (ARC) guidelines and workplace procedures:

- Followed DRSABCD in line with ARC guidelines, including:
  - performed at least 2 minutes of uninterrupted single rescuer cardiopulmonary resuscitation (CPR) (5 cycles of both compressions and ventilations) on an adult resuscitation manikin placed on the floor

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  - performed at least 2 minutes of uninterrupted single rescuer CPR (5 cycles both compressions and ventilations) on an infant resuscitation manikin placed on a firm surface
  - responded appropriately in the event of regurgitation or vomiting
  - managed the unconscious breathing casualty
  - followed single rescue procedure, including the demonstration of a rotation of operators with minimal interruptions to compressions
  - followed the prompts of an automated external defibrillator (AED)
- Responded to at least one simulated first aid scenario contextualised to the candidate's workplace/community setting, including:
  - demonstrated safe manual handling techniques
  - provided an accurate verbal or written report of the incident

Knowledge Evidence

The candidate must be able to demonstrate essential knowledge required to effectively complete tasks outlined in elements and performance criteria of this unit, manage tasks and manage contingencies in the context of the work role. This includes knowledge of:

- State/Territory regulations, first aid codes of practice and workplace procedures including:
  - ARC Guidelines relevant to the provision of CPR
  - safe work practices to minimise risks and potential hazards
  - infection control principles and procedures, including use of standard precautions
  - requirements for currency of skill and knowledge
- Legal, workplace and community considerations, including:
  - awareness of potential need for stress-management techniques and available support following an emergency situation
  - duty of care requirements
  - respectful behaviour towards a casualty
  - own skills and limitations
  - consent
  - privacy and confidentiality requirements
  - importance of debriefing
- Considerations when providing CPR, including:
  - airway obstruction due to body position
  - appropriate duration and cessation of CPR
  - appropriate use of an AED
  - chain of survival
  - standard precautions
- Basic anatomy and physiology relating to:
  - how to recognise a person is not breathing normally
  - chest

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- response/consciousness
- upper airway and effect of positional change

Assessment Conditions

Skills must be demonstrated working individually in an environment that provides realistic in-depth, industry-validated scenarios and simulations to assess candidates' skills and knowledge.

Assessment resources must include:

- adult and infant resuscitation manikins in line with ARC Guidelines for the purpose of assessment of CPR procedures
- AED training device
- workplace injury, trauma and/or illness record, or other appropriate workplace incident report form

Simulated assessment environments must simulate the real-life working environment where these skills and knowledge would be performed, with all the relevant equipment and resources of that working environment.

Assessor Requirements

Assessors must satisfy the Standards for Registered Training Organisations (RTOs) 2015/AQTF mandatory competency requirements for assessors.

In addition hold current first aid certificate HLTAID003 or higher.

Links

Companion Volume implementation guides are found in VETNet - https://vetnet.gov.au/Pages/TrainingDocs.aspx?q=ced1390f-48d9-4ab0-bd50-b015e5485705

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LGAWORK404A Manage a civil works project

Modification History

LGAWORK404A Release 2: Layout adjusted.

LGAWORK404A Release 1: Primary release.

Unit Descriptor

This unit covers managing a civil works project within council areas. The unit addresses all aspects of planning, implementing and monitoring a civil works project through to completion, including the documentation required to support the project.

Application of the Unit

This unit supports the attainment of skills and knowledge required for competent workplace performance in councils of all sizes and in varying locations. Knowledge of the legislation and regulations that provide the boundaries for the operation of civil works in councils is essential. The unit is particularly appropriate for staff responsible for supervising civil works projects and ensuring project outcomes are met.

Licensing/Regulatory Information

Not applicable.

Pre-Requisites

Not applicable.

Employability Skills Information

This unit contains employability skills.

Elements and Performance Criteria Pre-Content

Elements describe the essential outcomes of a Unit of Competency	Performance criteria describe the required performance needed to demonstrate achievement of the element. Where ***bold italicised*** text is used, further information is detailed in the Range Statement. Assessment of performance is to be consistent with the Evidence Guide.

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Elements and Performance Criteria

ELEMENT	PERFORMANCE CRITERIA
1 **Evaluate and assess the project**	1.1 A site evaluation is organised and undertaken to determine scope of project. 1.2 Work scope, desired outcomes and key dates are identified and recorded according to ***relevant legislation and standards .*** 1.3 Required ***resources*** are identified and their availability is determined.
2 **Plan and document the project**	2.1 Tasks associated with the project are identified and documented. 2.2 The preparation of technical specifications is coordinated and managed to completion within the required time frame. 2.3 An overview plan is prepared, distributed and reviewed by key stakeholders. 2.4 ***Contingency plans*** are developed to ensure that delays in completing the project are addressed as early as possible. 2.5 Effective and efficient communication strategies are developed and ***documented*** to meet the needs of project stakeholders and service providers.
3 **Prepare for project implementation**	3.1 A workforce with required numbers and skills is established and fully briefed as to job requirements and planned time frame. 3.2 Priorities are organised to ensure agreed time frame is met. 3.3 Resources are ordered and arrangements are initiated to ensure delivery to site in accordance with planned time frame. 3.4 Project plan and schedule are drawn up, reviewed and amended where necessary.
4 **Implement the project plan**	4.1 A workforce with required numbers and skills is established and fully briefed as to job requirements and planned time frame. 4.2 Priorities are organised to ensure agreed time frame is met. 4.3 Resources are ordered and arrangements are initiated to ensure delivery to site in accordance with planned time frame. 4.4 ***Project plan*** and schedule are drawn up, reviewed and amended where necessary.
5 **Monitor the project**	5.1 Project is regularly reviewed against project plan in relation

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ELEMENT	PERFORMANCE CRITERIA
	to safety, quality, resources, time frames, costs and equipment.
	5.2 Deviations from the project plan are identified and actions are taken to recover original project program.
	5.3 Deviations from original program requirements are reported to the appropriate personnel and direction is sought where necessary.
6 **Complete documentation**	6.1 Quality assurance documents and reports are provided in accordance with statutory, organisation or site requirements.
	6.2 Plant and maintenance records are maintained in accordance with occupational health and safety (OHS) requirements.
	6.3 Project completion is reviewed against the established plan and opportunities for future improvement are established and documented.

Required Skills and Knowledge

This describes the essential skills and knowledge and their level, required for this unit

Required Skills

- contingency management
- applying quality assurance and quality control procedures
- identifying sources of errors
- coordinating work scope
- priority management and organisational skills
- leadership and management skills
- communication
- time management
- resource management
- project management
- using construction equipment and materials
- conducting mathematical calculations relevant to civil construction works

Required Knowledge

- relevant OHS regulations
- relevant statutory legislation and codes of practice
- relevant site safety procedures
- environmental awareness and procedures

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- location of relevant plant and equipment
- quality assurance and control procedures
- plant and related systems
- contractual procedures
- project management principles and concepts
- work scope coordination and preparation
- human resource management principles
- civil construction knowledge and experience
- survey methodologies
- mathematical calculations relevant to planning and implementing civil works constructions

Evidence Guide

Overview of assessment requirements

A person who demonstrates competency in this unit will be able to perform the outcomes described in the Elements to the required performance level detailed in the Performance Criteria. The knowledge and skill requirements described in the Range Statement must also be demonstrated. For example, knowledge of the legislative framework and safe work practices that underpin the performance of the unit must be demonstrated.

Critical aspects of evidence to be considered

The demonstrated ability to:

- develop, implement and review detailed and thorough project plans in relation to civil works completed for council
- forecast, plan for and manage contingencies to ensure project outcomes are met within agreed time frames
- document accurately all project details according to legislative requirements and council standards
- ensure compliance with all legislative and regulatory requirements including observance of OHS legislation

Context of assessment

Competency is demonstrated by performance of all stated criteria, with particular attention to the critical aspects of evidence and the knowledge and skills elaborated in the Evidence Guide, and within the scope of the Range Statement.

Assessment must take account of the endorsed Assessment Guidelines in the Local Government Training Package.

Assessment of the performance requirements in this unit should be undertaken in an actual workplace or simulated environment.

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	Assessment should reinforce the integration of the key competencies for the particular AQF level. Refer to the key competency levels at the end of this unit.
Relationship to other units (**prerequisite or co-requisite units**)	To enable holistic assessment this unit may be assessed with other units that form part of the job role.
Method of assessment	The following assessment methods are suggested: • observation of the learner performing a range of workplace tasks over sufficient time to demonstrate handling of a range of contingencies • written and/or oral questioning to assess knowledge and understanding • completion of workplace documentation • third-party reports from experienced practitioners • completion of self-paced learning materials including personal reflection and feedback from trainer, coach or supervisor
Evidence required for demonstration of consistent performance	Evidence should be collected over a set period of time that is sufficient to include an appropriate range and variety of situations.
Resource implications	The learner and trainer should have access to appropriate documentation and resources normally used in the workplace.

Range Statement

The Range Statement relates to the Unit of Competency as a whole. It allows for different work environments and situations that may affect performance. ***Bold italicised*** wording in the Performance Criteria is detailed below.

Relevant legislation and standards may include:	• OHS • quality assurance, including relevant Australian standards • environmental legislation • council regulations and by-laws
Resources may include:	• materials • plant • equipment, including specialist equipment • tools • finances • specialist contractors and personnel
Contingency plans may	• weather changes

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need to consider:	• worker injuries or illnesses • worker absences • supply breakdowns • machinery failures
Documentation may include:	• job cards • budgets • cost centres • check sheets • safety rule procedures • plant records • drawings • quality assurance procedures and documentation • maintenance procedures • codes of practice • contract specifications
Communication strategies may include:	• regular meetings with clients • regular meetings with field staff
Service providers may include:	• internal staff • contractors • contract specialists
Project plans may be drawn using:	• Gantt charts • PERT charts

Unit Sector(s)

Operational Works

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MEM05004C Perform routine oxy acetylene welding

Modification History

Not Applicable

Unit Descriptor

Unit descriptor	This unit covers preparing materials and performing routine oxy acetylene welding.

Application of the Unit

Application of the unit	This unit applies in a maintenance or manufacturing environment where the welding is not required to meet an Australian standard or equivalent. Fillet and butt welds would typically be performed on low carbon/mild steels. Where welding is required to meet Australian Standard 1554 General Purpose or equivalent codes, OHS regulations and/or licensing requirements, Unit MEM05022C (Perform advanced welding using oxy acetylene process) should be selected. **Band**: **A** **Unit Weight**: **2**

Licensing/Regulatory Information

Refer to Application of the Unit

Pre-Requisites

Prerequisite units		

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Prerequisite units		

Employability Skills Information

Employability skills	This unit contains employability skills.

Elements and Performance Criteria Pre-Content

Elements describe the essential outcomes of a unit of competency.	Performance criteria describe the performance needed to demonstrate achievement of the element. Where bold italicised text is used, further information is detailed in the required skills and knowledge section and the range statement. Assessment of performance is to be consistent with the evidence guide.

Elements and Performance Criteria

ELEMENT	**PERFORMANCE CRITERIA**
1. Identify weld requirements	1.1. Weld requirements are identified from job instructions. 1.2. Location of welds is identified in accordance with standard operating procedures and job specifications.
2. Prepare materials for welding	2.1. Materials are cleaned and prepared ready for welding.
3. Prepare equipment for welding	3.1. Welding equipment is set up correctly. 3.2. Settings and consumables are selected.
4. Perform routine welding using *oxy acetylene*	4.1. Safe welding practices are applied. 4.2. Materials are welded to job requirements. 4.3. Welds are cleaned in accordance with standard operating procedures.

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Required Skills and Knowledge

REQUIRED SKILLS AND KNOWLEDGE

This section describes the skills and knowledge required for this unit.

Required skills

Look for evidence that confirms skills in:

- preparing materials
- setting up welding equipment
- welding with oxy acetylene fuel gas
- reading and interpreting routine information on written job instructions, specifications and standard operating procedures
- following oral instructions
- using measurement skills for joint preparation and routine oxy acetylene welding

Required knowledge

Look for evidence that confirms knowledge of:

- preparatory requirements
- materials and consumables properties and characteristics
- equipment and equipment settings
- fuel gas properties and applications
- post welding treatments
- weld characteristics
- any applicable industry standards, NOHSC guides, State/Territory regulatory codes of practice/standards
- safe work practices and procedures
- safe welding practices
- use and application of personal protective equipment for routine oxy acetylene welding

Evidence Guide

EVIDENCE GUIDE

The evidence guide provides advice on assessment and must be read in conjunction with the performance criteria, required skills and knowledge, range statement and the Assessment

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EVIDENCE GUIDE	
Guidelines for the Training Package.	
Overview of assessment	A person who demonstrates competency in this unit must be able to prepare materials and carry out routine oxy acetylene welding.
Critical aspects for assessment and evidence required to demonstrate competency in this unit	Assessors must be satisfied that the candidate can competently and consistently perform all elements of the unit as specified by the criteria, including required knowledge, and be capable of applying the competency in new and different situations and contexts.
Context of and specific resources for assessment	This unit may be assessed on the job, off the job or a combination of both on and off the job. Where assessment occurs off the job, that is the candidate is not in productive work, then an appropriate simulation must be used where the range of conditions reflects realistic workplace situations. The competencies covered by this unit would be demonstrated by an individual working alone or as part of a team. The assessment environment should not disadvantage the candidate. This unit could be assessed in conjunction with any other units addressing the safety, quality, communication, materials handling, recording and reporting associated with performing routine oxy acetylene welding or other units requiring the exercise of the skills and knowledge covered by this unit.
Method of assessment	Assessors should gather a range of evidence that is valid, sufficient, current and authentic. Evidence can be gathered through a variety of ways including direct observation, supervisor's reports, project work, samples and questioning. Questioning techniques should not require language, literacy and numeracy skills beyond those required in this unit of competency. The candidate must have access to all tools, equipment, materials and documentation required. The candidate must be permitted to refer to any relevant workplace procedures, product and manufacturing specifications, codes, standards, manuals and reference materials.
Guidance information for assessment	

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Range Statement

RANGE STATEMENT	
The range statement relates to the unit of competency as a whole. It allows for different work environments and situations that may affect performance. Bold italicised wording, if used in the performance criteria, is detailed below. Essential operating conditions that may be present with training and assessment (depending on the work situation, needs of the candidate, accessibility of the item, and local industry and regional contexts) may also be included.	
Materials	Mild and low carbon steel and cast iron
Prepared	Preheating, setting up jigs, fixtures, clamps, joint preparation
Equipment	Hoses, blowpipes, regulators
Consumables	Filler rods, fluxes
Oxy acetylene	The term 'oxy-acetylene' is used here to describe a range of fuel gases, including acetylene, LPG, hydrogen etc.
Cleaned	Fluxes

Unit Sector(s)

Unit sector	

Co-requisite units

Co-requisite units		

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Competency field

Competency field	Fabrication

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MEM05005B Carry out mechanical cutting

Modification History

Not Applicable

Unit Descriptor

Unit descriptor	This unit covers setting up and operating a range of mechanical cutting and holing equipment.

Application of the Unit

Application of the unit	This unit applies to sawing, shearing, cropping and/or holing and includes setting up and operating a range of equipment. Examples of machines that could be covered include guillotines, croppers, cold saws, band saws, automatic saws etc. Typical applications of this unit may include cutting for manufacture, production cutting and cutting of materials selected from stores in a maintenance environment. This unit does not cover hand or hand held power tools used for cutting e.g. circular saws, nibblers and side grinder. These skills are covered by Unit MEM18001C (Use hand tools) and Unit MEM18002B (Use power tools/hand held operations). This unit does not include the skills required for operational maintenance of the equipment used; these skills are covered by Unit MEM07001B (Perform operational maintenance of machines/equipment). For repair and welding of band saw blades where blade repair unit is not attached to the machine, refer to Unit MEM05013C (Perform manual production welding). **Band**: **A** **Unit Weight**: **2**

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Licensing/Regulatory Information

Not Applicable

Pre-Requisites

Prerequisite units		
Path 1	MEM12023A	Perform engineering measurements
	MEM18001C	Use hand tools

Employability Skills Information

Employability skills	This unit contains employability skills.

Elements and Performance Criteria Pre-Content

Elements describe the essential outcomes of a unit of competency.	Performance criteria describe the performance needed to demonstrate achievement of the element. Where bold italicised text is used, further information is detailed in the required skills and knowledge section and the range statement. Assessment of performance is to be consistent with the evidence guide.

Elements and Performance Criteria

ELEMENT	**PERFORMANCE CRITERIA**
1. Determine job requirements	1.1. Job requirements and specifications are determined from job sheets and/or instructions. 1.2. Appropriate method/machine is selected to meet specifications. 1.3. Machine is loaded and adjusted for operation consistent with standard operating procedures.
2. Select/set up machine tooling	2.1. Tooling is selected to match job requirements. 2.2. Tooling is correctly installed using standard

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ELEMENT	PERFORMANCE CRITERIA
	operating procedures. 2.3. Machine is set up and adjusted using standard operating procedures.
3. Operate mechanical cutting machine	3.1. Appropriate stops and guards are set and adjusted as required. 3.2. Material is secured and correctly positioned using measuring equipment as necessary. 3.3. Machine is started and stopped safely to standard operating procedures. 3.4. Machine is operated to cut/hole material to specifications using standard operating procedures.
4. Check material for conformance to specification	4.1. Material is checked against specification. Machine and/or tooling is adjusted as required and in process adjustments carried out as necessary. 4.2. Material is cut and/or holed to within workplace tolerances. 4.3. Material is used in most economical way. 4.4. Codes and standards are observed.

Required Skills and Knowledge

REQUIRED SKILLS AND KNOWLEDGE
This section describes the skills and knowledge required for this unit.
Required skills
Look for evidence that confirms skills in: • loading and adjusting cutting machines • selecting machines and tooling • installing cutting tool • setting up and adjusting cutting machine • securing and correctly positioning materials • cutting and holing materials • applying relevant codes and standards • reading and interpreting routine information on written job instructions, specifications and standard operating procedures • following oral instruction • measuring materials to specified workplace tolerances and within the machine

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REQUIRED SKILLS AND KNOWLEDGE
range • clarifying routine task-related information
Required knowledge
Look for evidence that confirms knowledge of: • the characteristics of cutting methods and machines • effect of materials on the machine tooling, tooling defects and adjustments • effect of adjustments on the dimensions of the cut material • applicable tolerances • methods of marking out materials to ensure minimum wastage • any applicable industry standards, national/Australian standards, NOHSC guides, State/Territory regulatory codes of practice/standard • use and application of personal protective equipment for mechanical cutting • safe work practices and procedures

Evidence Guide

EVIDENCE GUIDE	
The evidence guide provides advice on assessment and must be read in conjunction with the performance criteria, required skills and knowledge, range statement and the Assessment Guidelines for the Training Package.	
Overview of assessment	A person who demonstrates competency in this unit must be able to carry out mechanical cutting on a range of machines. Competency in this unit cannot be claimed until all prerequisites have been satisfied.
Critical aspects for assessment and evidence required to demonstrate competency in this unit	Assessors must be satisfied that the candidate can competently and consistently perform all elements of the unit as specified by the criteria, including required knowledge, and be capable of applying the competency in new and different situations and contexts.
Context of and specific resources for assessment	This unit may be assessed on the job, off the job or a combination of both on and off the job. Where assessment occurs off the job, that is the candidate is not in productive work, then an appropriate simulation must be used where the range of conditions reflects realistic workplace situations. The competencies covered by this

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EVIDENCE GUIDE	
	unit would be demonstrated by an individual working alone or as part of a team. The assessment environment should not disadvantage the candidate. This unit could be assessed in conjunction with any other units addressing the safety, quality, communication materials handling, recording and reporting associated with carrying out mechanical cutting or other units requiring the exercise of the skills and knowledge covered by this unit.
Method of assessment	Assessors should gather a range of evidence that is valid, sufficient, current and authentic. Evidence can be gathered through a variety of ways including direct observation, supervisor's reports, project work, samples and questioning. Questioning techniques should not require language, literacy and numeracy skills beyond those required in this unit of competency. The candidate must have access to all tools, equipment, materials and documentation required. The candidate must be permitted to refer to any relevant workplace procedures, product and manufacturing specifications, codes, standards, manuals and reference materials.
Guidance information for assessment	

Range Statement

RANGE STATEMENT	
The range statement relates to the unit of competency as a whole. It allows for different work environments and situations that may affect performance. Bold italicised wording, if used in the performance criteria, is detailed below. Essential operating conditions that may be present with training and assessment (depending on the work situation, needs of the candidate, accessibility of the item, and local industry and regional contexts) may also be included.	
Machine	Guillotines, croppers, cold saws, band saws, automatic saws etc.
Tooling	Tooling to suit guillotines, croppers, cold saws, band saws, automatic saws etc.

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RANGE STATEMENT	
Stops and guards	All safety equipment/stops/guards on guillotines, croppers, cold saws, band saws, automatic saws etc.
Material	Ferrous and non-ferrous metals and non-metallic products
Codes and standards	Legislative and regulatory requirements, industry and enterprise codes and standards

Unit Sector(s)

Unit sector	

Co-requisite units

Co-requisite units		

Competency field

Competency field	Fabrication

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MEM05007C Perform manual heating and thermal cutting

Modification History

Not Applicable

Unit Descriptor

Unit descriptor	This unit covers performing manual heating, thermal cutting and gouging including the assembly and disassembly and operation of the equipment on a range of materials (ferrous, non-ferrous and non-metallic) using a variety of methods.

Application of the Unit

Application of the unit	This unit applies to manual, straight line cutting standards. Manual or automatic processes are used to cut and heat to specifications. Cutting may include flame gouging by hand. All work is carried out to legislative and regulatory requirements. Predetermined standards of quality and safety are observed and work is carried out following standard operating procedures. **Band**: **A** **Unit Weight**: **2**

Licensing/Regulatory Information

Not Applicable

Pre-Requisites

Prerequisite units		

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Prerequisite units		

Employability Skills Information

Employability skills	This unit contains employability skills.

Elements and Performance Criteria Pre-Content

Elements describe the essential outcomes of a unit of competency.	Performance criteria describe the performance needed to demonstrate achievement of the element. Where bold italicised text is used, further information is detailed in the required skills and knowledge section and the range statement. Assessment of performance is to be consistent with the evidence guide.

Elements and Performance Criteria

ELEMENT	**PERFORMANCE CRITERIA**
1. Assemble/disassemble plant and equipment	1.1. Accessories and equipment are correctly selected and assembled for manual heating and thermal cutting.
2. Operate heating and thermal cutting equipment	2.1. Cutting process and/or procedure appropriate for material is selected. 2.2. All safety procedures are observed. 2.3. Equipment start-up procedures are followed correctly to standard operating procedures. 2.4. Equipment adjustments are made correctly using standard operating procedures. 2.5. Appropriate cutting allowances are made. 2.6. Material is used in the most economical way. 2.7. Defects are identified and corrective action is taken to standard operating procedures. 2.8. Material is heated and cut to specification.

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ELEMENT	PERFORMANCE CRITERIA
	2.9. Shape/size/length is to accepted workplace standards.

Required Skills and Knowledge

REQUIRED SKILLS AND KNOWLEDGE
This section describes the skills and knowledge required for this unit.
Required skills
Look for evidence that confirms skills in: • performing pre-start checks • safely starting equipment • following standard operating procedures • adjusting equipment to operating specifications • making cutting allowances • economising material and minimising wastage • identifying cutting defects and taking corrective action • heating and cutting materials to specifications • reading and interpreting routine information on written job instructions, specifications and standard operating procedures. May include drawings • following oral instructions • performing measurements needed to meet the requirements of this unit • entering routine and familiar information onto proformas and standard workplace forms
Required knowledge
Look for evidence that confirms knowledge of: • cutting processes appropriate to various materials • heating and cutting specifications • procedures for heating and cutting • the tools, equipment and techniques for heating and cutting • assembling procedures for equipment and accessories • hazards and control measures associated with manual heating and thermal cutting • use and application of personal protective clothing and equipment • equipment pre-checks and operation • procedures for adjusting heating and cutting equipment

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REQUIRED SKILLS AND KNOWLEDGE
• cutting allowances and reasons for applying them • procedures for minimising waste material • reasons for minimising waste material • cutting defects and their causes • procedures for correcting cutting defects • tools, equipment and techniques required to correct cutting defects • use and application of personal protective equipment • safe work practices and procedures

Evidence Guide

EVIDENCE GUIDE	
The evidence guide provides advice on assessment and must be read in conjunction with the performance criteria, required skills and knowledge, range statement and the Assessment Guidelines for the Training Package.	
Overview of assessment	A person who demonstrates competency in this unit must be able to perform manual heating and thermal cutting.
Critical aspects for assessment and evidence required to demonstrate competency in this unit	Assessors must be satisfied that the candidate can competently and consistently perform all elements of the unit as specified by the criteria, including required knowledge, and be capable of applying the competency in new and different situations and contexts.
Context of and specific resources for assessment	This unit may be assessed on the job, off the job or a combination of both on and off the job. Where assessment occurs off the job, that is the candidate is not in productive work, then an appropriate simulation must be used where the range of conditions reflects realistic workplace situations. The competencies covered by this unit would be demonstrated by an individual working alone or as part of a team. The assessment environment should not disadvantage the candidate. This unit could be assessed in conjunction with any other units addressing the safety, quality, communication, materials handling, recording and reporting associated with manual heating/thermal cutting or other units requiring the exercise of the skills and knowledge covered by this unit.

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EVIDENCE GUIDE	
Method of assessment	Assessors should gather a range of evidence that is valid, sufficient, current and authentic. Evidence can be gathered through a variety of ways including direct observation, supervisor's reports, project work, samples and questioning. Questions should not require language, literacy and numeracy skills beyond those required in this unit. The candidate must have access to all tools, equipment, materials and documentation required. The candidate must be permitted to refer to any relevant workplace procedures, product and manufacturing specifications, codes, standards, manuals and reference materials.
Guidance information for assessment	

Range Statement

RANGE STATEMENT	
The range statement relates to the unit of competency as a whole. It allows for different work environments and situations that may affect performance. Bold italicised wording, if used in the performance criteria, is detailed below. Essential operating conditions that may be present with training and assessment (depending on the work situation, needs of the candidate, accessibility of the item, and local industry and regional contexts) may also be included.	
Cutting	Use of hand held and self-propelled straight line cutters
Process	Fuel gas, oxy fuel gas and air fuel gas
Material	Various thicknesses and types including ferrous, non-ferrous and non-metallic materials

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Unit Sector(s)

Unit sector	

Co-requisite units

Co-requisite units		

Competency field

Competency field	Fabrication

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MEM05011D Assemble fabricated components

Modification History

Not Applicable

Unit Descriptor

Unit descriptor	This unit of competency covers the assembly of general fabricated components in plate, pipe and section or sheet either on-site or in a typical fabrication workplace by an Engineering Tradesperson - Fabrication. Assembly is performed according to specifications or drawings. The unit covers trade level assembly techniques requiring the use of jigs, fixtures and tools.

Application of the Unit

Application of the unit	This unit of competency applies to assembly of ferrous and non-ferrous fabrications to specifications including use of joining techniques. Skills covered by this unit are generally applied in occupational and work situations associated with steel fabrication, boilermaking or sheet metal work. This unit has been developed for Engineering Tradesperson - Fabrication apprenticeship training and the recognition of trade skills in assembly of fabricated components. Typical applications are transitions, pipeworks and structural fabrication, ductwork, general jobbing work, fired and unfired pressure vessels. Work may be undertaken in plant or on-site, and as part of a team in many instances in cooperation with those with rigging/dogging skills where necessary. This unit does not cover the skills for the assembly of fabricated engineering components. These skills are covered by MEM18006C Repair and fit engineering components. Assembly using pre-constructed jigs is covered by MEM03001B Perform manual production assembly or

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	MEM03003B Perform sheet and plate assembly. Where welds are required to meet legislative or regulatory requirements, then appropriate welding units should also be selected. **Band**: **A** **Unit Weight**: **8**

Licensing/Regulatory Information

Not Applicable

Pre-Requisites

Prerequisite units		
Path 1	MEM05005B	Carry out mechanical cutting
	MEM05007C	Perform manual heating and thermal cutting
	MEM05012C	Perform routine manual metal arc welding
	MEM05015D	Weld using manual metal arc welding process
	MEM05051A	Select welding processes
	MEM05052A	Apply safe welding practices
	MEM09002B	Interpret technical drawing
	MEM12023A	Perform engineering measurements
	MEM18001C	Use hand tools
	MEM18002B	Use power tools/hand held operations
Path 2	MEM05005B	Carry out mechanical cutting

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Prerequisite units		
	MEM05007C	Perform manual heating and thermal cutting
	MEM05019D	Weld using gas tungsten arc welding process
	MEM05049B	Perform routine gas tungsten arc welding
	MEM05051A	Select welding processes
	MEM05052A	Apply safe welding practices
	MEM09002B	Interpret technical drawing
	MEM12023A	Perform engineering measurements
	MEM18001C	Use hand tools
	MEM18002B	Use power tools/hand held operations
Path 3	MEM05004C	Perform routine oxy acetylene welding
	MEM05005B	Carry out mechanical cutting
	MEM05007C	Perform manual heating and thermal cutting
	MEM05022C	Perform advanced welding using oxy acetylene welding process
	MEM05051A	Select welding processes
	MEM05052A	Apply safe welding practices
	MEM09002B	Interpret technical drawing
	MEM12023A	Perform engineering measurements
	MEM18001C	Use hand tools
	MEM18002B	Use power tools/hand held operations
Path 4	MEM05005B	Carry out mechanical cutting

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Prerequisite units		
	MEM05007C	Perform manual heating and thermal cutting
	MEM05017D	Weld using gas metal arc welding process
	MEM05050B	Perform routine gas metal arc welding
	MEM05051A	Select welding processes
	MEM05052A	Apply safe welding practices
	MEM09002B	Interpret technical drawing
	MEM12023A	Perform engineering measurements
	MEM18001C	Use hand tools
	MEM18002B	Use power tools/hand held operations

Employability Skills Information

Employability skills	This unit contains employability skills.

Elements and Performance Criteria Pre-Content

Elements describe the essential outcomes of a unit of competency.	Performance criteria describe the performance needed to demonstrate achievement of the element. Where bold italicised text is used, further information is detailed in the required skills and knowledge section and the range statement. Assessment of performance is to be consistent with the evidence guide.

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Elements and Performance Criteria

ELEMENT	PERFORMANCE CRITERIA
1. Identify assembly method and construct jigs if required	1.1. Method is identified and jigs are constructed from engineering drawings or according to workshop practice 1.2. Distortion prevention/control techniques are correctly applied
2. Ensure all components for assembly are available	2.1. All components are checked against drawings and material list
3. Select tools and fixtures for fabrication assembly	3.1. Most appropriate equipment is selected
4. Assemble fabricated components	4.1. Material and/or fabricated components are correctly positioned 4.2. Jigs, fixtures, tools and measuring equipment are correctly adjusted and applied 4.3. Datum line is correctly determined if necessary 4.4. Assembled components are checked for position including squareness, level and alignment to specification 4.5. Fixing/joining techniques are applied as necessary according to standard operating procedures 4.6. Assembly is checked for compliance with drawing 4.7. Codes/standards are interpreted and applied

Required Skills and Knowledge

REQUIRED SKILLS AND KNOWLEDGE
This section describes the skills and knowledge required for this unit.
Required skills
Required skills include: • constructing jigs where appropriate • applying distortion prevention/control techniques • positioning components in accordance with drawing/specifications

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REQUIRED SKILLS AND KNOWLEDGE
• using jigs, fixtures, tools and equipment • correctly marking the datum line • checking the position of all assembled components visually and dimensionally • using appropriate fixing/joining techniques
Required knowledge
Required knowledge includes: • methods for assembly of fabricated components • jigs construction • effects of distortion of fabricated components • distortion prevention techniques • drawing and material list • characteristics of relevant tools and equipment squareness, level and alignment • function of datum lines • variety of fixing/joining techniques • defects associated with the assembly of fabricated components • methods of rectification of defects by rework or adjustment • requirements of relevant codes/standards

Evidence Guide

EVIDENCE GUIDE	
The evidence guide provides advice on assessment and must be read in conjunction with the performance criteria, required skills and knowledge, range statement and the Assessment Guidelines for the Training Package.	
Overview of assessment	A person who demonstrates competency in this unit must be able to safely assemble general fabricated components in plate, pipe and section or sheet to specifications and drawings using accepted engineering trade techniques, practices, processes and workplace procedures. Competency in this unit cannot be awarded until all prerequisites have been satisfied.
Critical aspects for assessment and evidence required to demonstrate competency in this unit	Assessors must be satisfied that the candidate can competently and consistently apply the skills covered in this unit of competency in new and different situations and contexts. Critical aspects of assessment and evidence

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EVIDENCE GUIDE	
	include: • planning assembly tasks and sequences • determining and implementing appropriate distortion control techniques • assembling general fabricated components in plate, pipe,section or sheet to specifications, codes, occupational health and safety (OHS) regulations and standard operating procedures • demonstrating safe working practices at all times • ability to assemble components in a workshop and site environment
Context of and specific resources for assessment	This unit has been developed to support training in and recognition of trade level competency in assembly of fabricated components as applied to a sheet metal or metal fabrication environment. Assessment should emphasise a workplace context and procedures found in the candidate's workplace. The competencies covered by this unit can be demonstrated by an individual working alone or as part of a team. The assessment environment should not disadvantage the candidate.
Method of assessment	Typically, persons engaged in Engineering Tradesperson - Fabrication work are required to use their fabricated assembly skills and techniques across a range of jobs and specifications. A single assessment event is not appropriate. On the job assessment should be included as part of the assessment process wherever possible. Where assessment occurs off the job, judgement must consider evidence of the candidate's performance in a productive work environment that includes a sufficient range of appropriate tasks and materials to cover the scope of application for this unit. Assessors should gather a range of evidence that is valid, sufficient, current and authentic. Evidence can be gathered through a variety of ways including direct observation, supervisor's reports, project work, samples and questioning. Questioning techniques should not require language, literacy and numeracy skills beyond those required in this unit of competency. The candidate must have access to all tools, equipment, materials and documentation required. The candidate

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EVIDENCE GUIDE	
	must be permitted to refer to any relevant workplace procedures, product and manufacturing specifications, codes, standards, manuals and reference materials.
Guidance information for assessment	This unit could be assessed in conjunction with any other units addressing the safety, quality, communication, materials handling, recording and reporting associated with the assembly of fabricated components or other units requiring the exercise of the skills and knowledge covered by this unit. Assessors must be satisfied that the candidate can competently and consistently perform all elements of the unit as specified by the criteria, including required knowledge, and be capable of applying the competency in new and different situations and contexts.

Range Statement

RANGE STATEMENT	
The range statement relates to the unit of competency as a whole. It allows for different work environments and situations that may affect performance. Bold italicised wording, if used in the performance criteria, is detailed below. Essential operating conditions that may be present with training and assessment (depending on the work situation, needs of the candidate, accessibility of the item, and local industry and regional contexts) may also be included.	
Distortion prevention/control techniques	Distortion prevention/control techniques may include: • jigs • fixtures • heat • clamps
Components	Components may include general fabricated components in either plate, pipe and section or sheet
Alignment	Alignment may include typical structural alignment and levelling using planes and line straight edges, spirit levels, line levels and

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RANGE STATEMENT	
	squares
Fixing/joining techniques	Fixing/joining techniques may include: • welding • adhesives • fasteners • rivets
Codes/standards	All work carried out in accordance with legislative and regulatory requirements

Unit Sector(s)

Unit sector	

Co-requisite units

Co-requisite units		

Competency field

Competency field	Fabrication

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MEM05012C Perform routine manual metal arc welding

Modification History

Not Applicable

Unit Descriptor

Unit descriptor	This unit covers preparing the materials and carrying out routine manual metal arc welding (MMAW).

Application of the Unit

Application of the unit	This unit applies in a maintenance or manufacturing environment where the welding is not required to meet an Australian standard or equivalent. Fillet and butt welds would typically be performed on low carbon/mild steels. Where welding is required to AS 1554 General Purpose or equivalent codes, occupational health and safety regulations and/or licensing requirements, Unit MEM05015D (Weld using manual metal arc welding process) should be selected. **Band**: **A** **Unit Weight**: **2**

Licensing/Regulatory Information

Refer to Application of the Unit

Pre-Requisites

Prerequisite units		

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Prerequisite units		

Employability Skills Information

Employability skills	This unit contains employability skills.

Elements and Performance Criteria Pre-Content

Elements describe the essential outcomes of a unit of competency.	Performance criteria describe the performance needed to demonstrate achievement of the element. Where bold italicised text is used, further information is detailed in the required skills and knowledge section and the range statement. Assessment of performance is to be consistent with the evidence guide.

Elements and Performance Criteria

ELEMENT	**PERFORMANCE CRITERIA**
1. Identify weld requirements	1.1. Weld requirements are identified from job instructions. 1.2. Location of welds is identified in accordance with standard operating procedures and job specifications.
2. Prepare materials for welding	2.1. Materials are cleaned and prepared ready for welding.
3. Prepare equipment for welding	3.1. Welding equipment is set up correctly. 3.2. Correct electrodes are selected to suit application and settings.
4. Perform routine welding using MMAW	4.1. Safe welding practices are applied. 4.2. Materials are welded to job requirements. 4.3. Welds are cleaned in accordance with standard operating procedures.

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Required Skills and Knowledge

REQUIRED SKILLS AND KNOWLEDGE
This section describes the skills and knowledge required for this unit.
Required skills
Look for evidence that confirms skills in: • preparing materials and electrodes • setting up welding equipment • welding with MMAW • reading and interpreting routine information on written job instructions, specifications and standard operating procedures • performing measurements for joint preparation and routine MMAW
Required knowledge
Look for evidence that confirms knowledge of: • material and equipment preparation • properties and characteristics of materials and consumables • weld characteristics • equipment set-up and settings • MMAW processes and properties • post-welding treatments • safe welding practices • use and application of personal protective equipment

Evidence Guide

EVIDENCE GUIDE	
The evidence guide provides advice on assessment and must be read in conjunction with the performance criteria, required skills and knowledge, range statement and the Assessment Guidelines for the Training Package.	
Overview of assessment	A person who demonstrates competency in this unit must be able to prepare materials and carry out routine manual metal arc welding (MMAW).

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EVIDENCE GUIDE	
Critical aspects for assessment and evidence required to demonstrate competency in this unit	Assessors must be satisfied that the candidate can competently and consistently perform all elements of the unit as specified by the criteria, including required knowledge, and be capable of applying the competency in new and different situations and contexts.
Context of and specific resources for assessment	This unit may be assessed on the job, off the job or a combination of both. Where assessment occurs off the job, i.e. the candidate is not in productive work, then appropriate simulation must be used where the range of conditions reflects realistic workplace situations. The competencies covered would be demonstrated by an individual working alone or as part of a team. The assessment environment should not disadvantage the candidate. This unit could be assessed in conjunction with any other units addressing the safety, quality, communication, materials handling, recording and reporting associated with performing routine manual metal arc welding or other units requiring the exercise of the skills and knowledge covered by this unit.
Method of assessment	Assessors should gather a range of evidence that is valid, sufficient, current and authentic. Evidence can be gathered through a variety of ways including direct observation, supervisor's reports, project work, samples and questioning. Questioning should not require language, literacy and numeracy skills beyond those required in this unit. The candidate must have access to all tools, equipment, materials and documentation required. The candidate must be permitted to refer to any relevant workplace procedures, product and manufacturing specifications, codes, standards, manuals and reference materials.
Guidance information for assessment	

Range Statement

RANGE STATEMENT

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RANGE STATEMENT	
The range statement relates to the unit of competency as a whole. It allows for different work environments and situations that may affect performance. Bold italicised wording, if used in the performance criteria, is detailed below. Essential operating conditions that may be present with training and assessment (depending on the work situation, needs of the candidate, accessibility of the item, and local industry and regional contexts) may also be included.	
Materials	Low and mild carbon steel or similar
Prepared	Cleaning, setting up jigs, fixtures, clamps, joint preparation
Welding equipment	Welding leads, welding machines, electrode holder etc.
Cleaned	Slag and spatter, cleaning, using files and grinders

Unit Sector(s)

Unit sector	

Co-requisite units

Co-requisite units		

Competency field

Competency field	Fabrication

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MEM05015D Weld using manual metal arc welding process

Modification History

Not Applicable

Unit Descriptor

Unit descriptor	This unit of competency covers the preparation, positioning, fixing, and manual welding techniques associated with general trade level welding using manual metal arc welding (MMAW) equipment including the selection and set up of the equipment appropriate to both the material and the weld to be performed, carrying out the MMAW to prescribed standards, and examining for and correcting defects, in a range of welded fabrications.

Application of the Unit

Application of the unit	This unit of competency applies to welds associated with heavy or light metal fabrications. Welds are fillet and butt welds in all positions on a range of ferrous and non-ferrous materials that may include carbon steel or stainless steel. Weld quality would conform to Australian Standard 1554 General Purpose, American Bureau of Shipping (ABS) or equivalent. This unit has been primarily developed for Engineering Tradesperson - Fabrication apprenticeship training and the recognition of trade level skills in MMAW. It may also apply to other trade occupations requiring higher level MMAW welding skills. Where manual thermal processes associated with preparation, pre-heat and/or post-heat are required, MEM05007C Perform manual heating and thermal cutting and/or MEM05008C Perform advanced manual thermal cutting, gouging and shaping should be considered for selection. **Band**: **A** **Unit Weight**: **4**

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Licensing/Regulatory Information

Not Applicable

Pre-Requisites

Prerequisite units		
Path 1	MEM05012C	Perform routine manual metal arc welding
	MEM05051A	Select welding processes
	MEM05052A	Apply safe welding practices
	MEM12023A	Perform engineering measurements
	MEM18001C	Use hand tools
	MEM18002B	Use power tools/hand held operations

Employability Skills Information

Employability skills	This unit contains employability skills.

Elements and Performance Criteria Pre-Content

Elements describe the essential outcomes of a unit of competency.	Performance criteria describe the performance needed to demonstrate achievement of the element. Where bold italicised text is used, further information is detailed in the required skills and knowledge section and the range statement. Assessment of performance is to be consistent with the evidence guide.

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Elements and Performance Criteria

ELEMENT	PERFORMANCE CRITERIA
1. Prepare materials for manual metal arc welding (MMAW)	1.1. Weld requirements are identified from specifications and/or drawings 1.2. Materials are correctly prepared 1.3. Materials are assembled/aligned to specification, where required
2. Select welding equipment and consumables	2.1. Welding equipment and electrodes appropriate to the material and the weld are identified and selected
3. Assemble and set up welding equipment	3.1. Welding equipment is assembled and set up
4. Minimise and rectify distortion	4.1. Appropriate distortion prevention measures are selected and applied 4.2. Distortion is rectified
5. Weld to job specification using MMAW	5.1. Weld deposit is to specification 5.2. Joints are cleaned to specifications
6. Ensure weld conformance	6.1. Defects are rectified with minimum loss of sound metal using correct techniques and tools 6.2. Weld joints are visually inspected for conformance to specifications
7. Where required, maintain weld records	7.1. Where required, weld records are completed correctly

Required Skills and Knowledge

REQUIRED SKILLS AND KNOWLEDGE

This section describes the skills and knowledge required for this unit.

Required skills

Required skills include:

- identifying and interpreting welding specifications including appropriate standards e.g. Australian Standard 1554 General Purpose, American Bureau of Shipping (ABS) or equivalent
- selecting and using appropriate tools and equipment

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REQUIRED SKILLS AND KNOWLEDGE
• using a variety of welding machines and electrodes • identifying and rectifying weld defects • applying techniques for distortion prevention and rectification • cleaning welds • reading and interpreting information on sketches, written job instructions, specifications, standard operating procedures and engineering drawings • recording routine information including routine weld records related to MMAW onto proformas and standard workplace forms • following oral instructions • measurement skills relating to joint preparation and MMAW
Required knowledge
Required knowledge includes: • material preparation • joint preparations • electrode classification • causes of distortion for materials within the scope of this unit • causes of defects and methods of rectification • the relationships between amperage, electrode and material • safe welding practices • use and application of personal protective equipment for MMAW

Evidence Guide

EVIDENCE GUIDE	
The evidence guide provides advice on assessment and must be read in conjunction with the performance criteria, required skills and knowledge, range statement and the Assessment Guidelines for the Training Package.	
Overview of assessment	A person who demonstrates competency in this unit must be able to prepare materials, select and set up the welding equipment, carry out MMAW and examine for and correct defects, in a range of welding activities associated with MMAW. Competency in this unit cannot be awarded until all prerequisites have been satisfied.
Critical aspects for assessment and evidence required to demonstrate	Assessors must be satisfied that the candidate can competently and consistently apply the skills covered in

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EVIDENCE GUIDE	
competency in this unit	this unit of competency in new and different workplace situations and contexts. Critical aspects of assessment and evidence include: • following all safety procedures to protect self, other workers and members of the public • identifying and interpreting specifications for MMA welding including Australian Standard 1554 General Purpose • interpreting welding specifications including standard welding symbols used to show weld procedure • selecting appropriate weld preparation methods for material and position of welds. • preparing materials, setting up of jigs, fixtures, clamps,etc. and joint preparation including bevelling • consistently welding different ferrous and non-ferrous materials to AS 1554 General Purpose or equivalent • identifying defects as described in the range statement across a range of welded materials • rectifying defects.
Context of and specific resources for assessment	Welding to AS 1554 General Purpose or equivalent requires both theoretical knowledge and high level practical skills. The assessment process must be designed to identify consistent performance to the standard and the specifications across a range of materials and positions. The assessment must also identify a level of workplace performance in terms of defect rates and weld failure rates. It is recommended that assessment involve demonstrations of competency under both workshop and site conditions. This means that the ideal assessment environment is either on the job or a combination of both on and off the job. The competencies covered by this unit may be demonstrated by an individual working alone or as part of a team. The assessment environment should not disadvantage the candidate.
Method of assessment	Typically an Engineering Tradesperson - Fabrication and other tradespersons engaged in welding are required to exercise MMAW skills and techniques across a range of jobs and specifications. A single assessment event is not appropriate. On the job assessment should be included as part of the assessment

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EVIDENCE GUIDE	
	process wherever possible. Where assessment occurs off the job, judgement must consider evidence of the candidate's performance in a productive work environment that includes a sufficient range of appropriate tasks and materials to cover the scope of application for this unit. Assessors should gather a range of evidence that is valid, sufficient, current and authentic. Evidence can be gathered through a variety of ways including direct observation, supervisor's reports, project work, samples and questioning. Questioning techniques should not require language, literacy and numeracy skills beyond those required in this unit of competency. The candidate must have access to all tools, equipment, materials and documentation required. The candidate must be permitted to refer to any relevant workplace procedures, product and manufacturing specifications, codes, standards, manuals and reference materials.
Guidance information for assessment	This unit could be assessed in conjunction with any other units addressing the safety, quality, communication, materials handling, recording and reporting associated with welding using MMAW process or other units requiring the exercise of the skills and knowledge covered by this unit. Assessors must be satisfied that the candidate can competently and consistently perform all elements of the unit as specified by the criteria, including required knowledge, and be capable of applying the competency in new and different situations and contexts.

Range Statement

RANGE STATEMENT
The range statement relates to the unit of competency as a whole. It allows for different work environments and situations that may affect performance. Bold italicised wording, if used in the performance criteria, is detailed below. Essential operating conditions that may be present with training and assessment (depending on the work situation, needs of the candidate, accessibility of the item, and local industry and regional contexts) may also be included.

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RANGE STATEMENT	
Welds	Welds include fillet and butt welds carried out in all positions
Materials	Materials may include ferrous materials including carbon or stainless steel, as well as non-ferrous metals and alloys suitable for MMA welding
Prepared	Preparation of materials may include: • pre-heating • setting up of jigs, fixtures and clamps • joint preparation (e.g. bevelling)
Equipment	Equipment may include AC or DC welding machines
Distortion prevention measures	Distortion prevention measures may include: • pre heating • setting up of jigs, fixtures and clamps
Rectified	Rectified refers to oxy acetylene, air arc equipment and grinding devices
Defects	Defects may include: • porosity • slag inclusions • discontinuities • lack of penetration • undercut

Unit Sector(s)

Unit sector	

Co-requisite units

Co-requisite units	

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Co-requisite units		

Competency field

Competency field	Fabrication

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MEM05016C Perform advanced welding using manual metal arc welding process

Modification History

Not Applicable

Unit Descriptor

Unit descriptor	This unit covers preparing materials, selecting and setting up the welding equipment, carrying out advanced manual metal arc welding (MMAW), inspecting for and correcting defects, and maintaining the weld records.

Application of the Unit

Application of the unit	This unit applies to welds associated with a range of structural sections and/or plate and/or pipe for general fabrication. Weld quality would typically conform to Australian Standard 1554 Structural Purpose, Bureau Det Norse Verticas or equivalent. Where advanced manual thermal cutting, gouging and shaping is carried out, Unit MEM05008C (Perform advanced manual thermal cutting, gouging and shaping) should also be selected. **Band**: **A** **Unit Weight**: **4**

Licensing/Regulatory Information

Not Applicable

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Pre-Requisites

Prerequisite units		
Path 1	MEM05007C	Perform manual heating and thermal cutting
	MEM05012C	Perform routine manual metal arc welding
	MEM05015D	Weld using manual metal arc welding process
	MEM05051A	Select welding processes
	MEM05052A	Apply safe welding practices
	MEM09002B	Interpret technical drawing
	MEM12023A	Perform engineering measurements
	MEM18001C	Use hand tools
	MEM18002B	Use power tools/hand held operations

Employability Skills Information

Employability skills	This unit contains employability skills.

Elements and Performance Criteria Pre-Content

Elements describe the essential outcomes of a unit of competency.	Performance criteria describe the performance needed to demonstrate achievement of the element. Where bold italicised text is used, further information is detailed in the required skills and knowledge section and the range statement. Assessment of performance is to be consistent with the evidence guide.

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Elements and Performance Criteria

ELEMENT	PERFORMANCE CRITERIA
1. Prepare welding materials and equipment	1.1. Welding equipment is prepared. 1.2. Welding equipment appropriate to task requirements is assembled and adjusted correctly and safely. 1.3. Materials are prepared to achieve the required weld specification.
2. Weld joints to code requirements using MMAW	2.1. Weld requirements are interpreted correctly. 2.2. Welds are deposited correctly to specifications. 2.3. Appropriate distortion prevention measures are selected for the weld type and material and distortions are rectified as required.
3. Assess weld quality and rectify faults	3.1. Weld joints are visually inspected against specifications. 3.2. Defects are removed using appropriate methods for the given task. 3.3. Weld records are correctly completed and maintained.

Required Skills and Knowledge

REQUIRED SKILLS AND KNOWLEDGE

This section describes the skills and knowledge required for this unit.

Required skills

Look for evidence that confirms skills in:

- welding to conform to Australian Standard 1554 Structural Purpose, Bureau Det Norse Verticas or equivalent
- interpreting weld requirements and specifications
- entering information onto proformas and standard workplace forms
- interpreting technical drawings and weld specifications relating to advanced MMAW
- using hand and power tools to prepare and weld material using MMAW
- using measurement and numeracy skills relating to advanced MMAW and preparation
- selecting equipment and consumables appropriate to the task
- using visual identification of faults/defects

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REQUIRED SKILLS AND KNOWLEDGE
Required knowledge
Look for evidence that confirms knowledge of: • in-depth knowledge of the properties and characteristics of a wide range of materials • requirements to conform to Australian Standard 1554 Structural Purpose, Bureau Det Norse Verticas or equivalent • weld procedures and requirements • different welder identification systems such as numbering, bar coding, paint coding, letter stamps • safety requirements • safe welding practices • use and application of personal protective equipment for MMAW

Evidence Guide

EVIDENCE GUIDE	
The evidence guide provides advice on assessment and must be read in conjunction with the performance criteria, required skills and knowledge, range statement and the Assessment Guidelines for the Training Package.	
Overview of assessment	A person who demonstrates competency in this unit must be able to prepare materials, select and set up the welding equipment, carry out advanced MMAW, inspect for and correct defects, and maintain the weld records. Competency in this unit cannot be claimed until all prerequisites have been satisfied.
Critical aspects for assessment and evidence required to demonstrate competency in this unit	Assessors must be satisfied that the candidate can competently and consistently perform all elements of the unit as specified by the criteria, including required knowledge, and be capable of applying the competency in new and different situations and contexts.
Context of and specific resources for assessment	This unit may be assessed on the job, off the job or a combination of both on and off the job. Where assessment occurs off the job, that is the candidate is not in productive work, then an appropriate simulation must be used where the range of conditions reflects realistic workplace situations. The competencies covered by this

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EVIDENCE GUIDE	
	unit would be demonstrated by an individual working alone or as part of a team. The assessment environment should not disadvantage the candidate. This unit could be assessed in conjunction with any other units addressing the safety, quality, communication, materials handling, recording and reporting associated with performing advanced welding using manual metal arc welding process (MMAW), or other units requiring the exercise of the skills and knowledge covered by this unit.
Method of assessment	Assessors should gather a range of evidence that is valid, sufficient, current and authentic. Evidence can be gathered through a variety of ways including direct observation, supervisor's reports, project work, samples and questioning. Questioning techniques should not require language, literacy and numeracy skills beyond those required in this unit of competency. The candidate must have access to all tools, equipment, materials and documentation required. The candidate must be permitted to refer to any relevant workplace procedures, product and manufacturing specifications, codes, standards, manuals and reference materials.
Guidance information for assessment	

Range Statement

RANGE STATEMENT	
The range statement relates to the unit of competency as a whole. It allows for different work environments and situations that may affect performance. Bold italicised wording, if used in the performance criteria, is detailed below. Essential operating conditions that may be present with training and assessment (depending on the work situation, needs of the candidate, accessibility of the item, and local industry and regional contexts) may also be included.	
Welding equipment	AC or DC welding machines, settings, electrodes and related equipment
Materials	Materials used would include low carbon, cast

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RANGE STATEMENT	
	iron, stainless and low alloy steel
Prepared	Preparation of materials may include preheating, setting up of jigs, fixtures, clamps, etc., joint preparation e.g. bevelling
Welds	Welds would be fillet and butt in all positions
Distortion prevention measures	Distortion prevention may include preheating, setting up of jigs, fixtures, clamps, etc.
Defects	Porosity, slag inclusions, discontinuities, lack of penetration, undercut
Appropriate methods	Oxy acetylene and air arc equipment and grinding devices
Weld records	Proformas and other standard workplace forms

Unit Sector(s)

Unit sector	

Co-requisite units

Co-requisite units		

Competency field

Competency field	Fabrication

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MEM05017D Weld using gas metal arc welding process

Modification History

Not Applicable

Unit Descriptor

Unit descriptor	This unit of competency covers the preparation, positioning, fixing, and manual welding techniques associated with general trade level welding using gas metal arc welding (GMAW) equipment including the selection and set up of the equipment appropriate to both the material and the weld to be performed, carrying out the GMAW to prescribed standards, and examining for and correcting defects, in a range of welded fabrications.

Application of the Unit

Application of the unit	This unit of competency applies to welds associated with heavy or light metal fabrications. Welds are fillet and butt welds in all positions on a range of ferrous and non-ferrous materials that may include carbon steel or stainless steel. Weld quality would conform to Australian Standard 1554 General Purpose, American Bureau of Shipping (ABS) or equivalent. This unit has been primarily developed for Engineering Tradesperson - Fabrication apprenticeship training and the recognition of trade level skills in GMAW. It may also apply to other trade occupations requiring higher level GMAW welding skills. Where manual thermal processes associated with preparation, pre-heat and/or post-heat are required, MEM05007C Perform manual heating and thermal cutting and/or MEM05008C Perform advanced manual thermal cutting, gouging and shaping should be considered for selection. **Band**: **A** **Unit Weight**: **4**

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Licensing/Regulatory Information

Not Applicable

Pre-Requisites

Prerequisite units		
Path 1	MEM05050B	Perform routine gas metal arc welding
	MEM05051A	Select welding processes
	MEM05052A	Apply safe welding practices
	MEM12023A	Perform engineering measurements
	MEM18001C	Use hand tools
	MEM18002B	Use power tools/hand held operations

Employability Skills Information

Employability skills	This unit contains employability skills.

Elements and Performance Criteria Pre-Content

Elements describe the essential outcomes of a unit of competency.	Performance criteria describe the performance needed to demonstrate achievement of the element. Where bold italicised text is used, further information is detailed in the required skills and knowledge section and the range statement. Assessment of performance is to be consistent with the evidence guide.

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Elements and Performance Criteria

ELEMENT	PERFORMANCE CRITERIA
1. Prepare materials for gas metal arc welding (GMAW)	1.1. Weld requirements are identified from specifications and/or drawings 1.2. Material is correctly prepared 1.3. Materials are assembled/aligned to specification where required
2. Select welding components and consumables	2.1. Welding machine settings, accessories and consumables are identified and selected
3. Assemble and set up welding equipment	3.1. Welding equipment is assembled and set up
4. Minimise and rectify distortion	4.1. Appropriate distortion prevention measures are selected and applied 4.2. Distortion is rectified
5. Weld to job specification using GMAW	5.1. Weld deposit is to specifications 5.2. Joints are cleaned to specifications
6. Ensure weld conformance	6.1. Weld joints are visually inspected for conformance to specifications 6.2. Defects are removed with minimum loss of sound metal using correct and appropriate techniques and tools
7. Maintain weld records as required	7.1. Weld records are completed correctly

Required Skills and Knowledge

REQUIRED SKILLS AND KNOWLEDGE

This section describes the skills and knowledge required for this unit.

Required skills

Required skills include:

- identifying and interpreting welding specifications including appropriate standards e.g. Australian Standard 1554 General Purpose, American Bureau of Shipping (ABS) or equivalent
- selecting and using appropriate tools and equipment

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REQUIRED SKILLS AND KNOWLEDGE
• using a variety of welding machines and electrodes • identifying and rectifying weld defects • applying techniques for distortion prevention and rectification • cleaning welds • reading and interpreting information on sketches, written job instructions, specifications, standard operating procedures and engineering drawings • recording routine information including routine weld records related to GMAW onto proformas and standard workplace forms • following oral instructions • measurement skills relating to joint preparation and GMAW
Required knowledge
Required knowledge includes: • types of gases and their uses • the relationships between amperage/wire feed, voltage, gas flow, electrode and material • the application of weld metal transfer (short arc, spray etc.) • correct welding machine, leads, hand pieces and electrodes • material preparation • joint preparations • electrode classification • causes of distortion for materials within the scope of this unit • safe welding practices • use and application of personal protective equipment for GMAW

Evidence Guide

EVIDENCE GUIDE	
The evidence guide provides advice on assessment and must be read in conjunction with the performance criteria, required skills and knowledge, range statement and the Assessment Guidelines for the Training Package.	
Overview of assessment	A person who demonstrates competency in this unit must be able to prepare materials, select and set up the welding equipment, carry out GMAW and examine for and correct defects, in a range of welding activities associated with GMAW. Competency in this unit cannot be awarded until all prerequisites have been satisfied.

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EVIDENCE GUIDE	
Critical aspects for assessment and evidence required to demonstrate competency in this unit	Assessors must be satisfied that the candidate can competently and consistently apply the skills covered in this unit of competency in new and different workplace situations and contexts. Critical aspects of assessment and evidence include: • following all safety procedures to protect self, other workers and members of the public • identifying and interpreting specifications for GMAW including Australian Standard 1554 General Purpose • interpreting welding specifications including standard welding symbols used to show weld procedure • selecting appropriate weld preparation methods for material and position of welds. • preparing materials, setting up of jigs, fixtures, clamps,etc. and joint preparation including bevelling • consistently welding different ferrous and non-ferrous materials to AS 1554 General Purpose or equivalent • identifying defects as described in the range statement across a range of welded materials • rectifying defects.
Context of and specific resources for assessment	Welding to AS 1554 General Purpose or equivalent requires both theoretical knowledge and high level practical skills. The assessment process must be designed to identify consistent performance to the standard and the specifications across a range of materials and positions. The assessment must also identify a level of workplace performance in terms of defect rates and weld failure rates. It is recommended that assessment involve demonstrations of competency under both workshop and site conditions. This means that the ideal assessment environment is either on the job or a combination of both on and off the job. The competencies covered by this unit may be demonstrated by an individual working alone or as part of a team. The assessment environment should not disadvantage the candidate.
Method of assessment	Typically an Engineering Tradesperson - Fabrication and other tradespersons engaged in welding are required to exercise GMAW skills and techniques across a range of jobs and specifications.

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	A single assessment event is not appropriate. On the job assessment should be included as part of the assessment process wherever possible. Where assessment occurs off the job, judgement must consider evidence of the candidate's performance in a productive work environment that includes a sufficient range of appropriate tasks and materials to cover the scope of application for this unit. Assessors should gather a range of evidence that is valid, sufficient, current and authentic. Evidence can be gathered through a variety of ways including direct observation, supervisor's reports, project work, samples and questioning. Questioning techniques should not require language, literacy and numeracy skills beyond those required in this unit of competency. The candidate must have access to all tools, equipment, materials and documentation required. The candidate must be permitted to refer to any relevant workplace procedures, product and manufacturing specifications, codes, standards, manuals and reference materials.
Guidance information for assessment	This unit could be assessed in conjunction with any other units addressing the safety, quality, communication, materials handling, recording and reporting associated with welding using GMAW process or other units requiring the exercise of the skills and knowledge covered by this unit. Assessors must be satisfied that the candidate can competently and consistently perform all elements of the unit as specified by the criteria, including required knowledge, and be capable of applying the competency in new and different situations and contexts.

Range Statement

RANGE STATEMENT
The range statement relates to the unit of competency as a whole. It allows for different work environments and situations that may affect performance. Bold italicised wording, if used in the performance criteria, is detailed below. Essential operating conditions that may be present with training and assessment (depending on the work

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RANGE STATEMENT	
situation, needs of the candidate, accessibility of the item, and local industry and regional contexts) may also be included.	
Weld	Welds include fillet and butt welds carried out in all positions
Materials	Materials may include ferrous materials including carbon or stainless steel, as well as non-ferrous metals and alloys suitable for GMAW
Prepared	Preparation of materials may include: • pre-heating • setting up of jigs, fixtures and clamps • joint preparation (e.g. bevelling)
Equipment	Equipment may include AC or DC welding machines
Distortion prevention measures	Distortion prevention measures may include: • pre-heating • setting up of jigs, fixtures and clamps
Rectified	Rectified refers to oxy acetylene, air arc equipment and grinding devices
Defects	Defects may include: • porosity • slag inclusions • discontinuities • lack of penetration • undercut

Unit Sector(s)

Unit sector	

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Co-requisite units

Co-requisite units		

Competency field

Competency field	Fabrication

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MEM05018C Perform advanced welding using gas metal arc welding process

Modification History

Not Applicable

Unit Descriptor

Unit descriptor	This unit covers preparing materials, selecting and setting up the welding equipment, carrying out advanced gas metal arc welding (GMAW), inspecting for and correcting defects, and maintaining the weld records.

Application of the Unit

Application of the unit	This unit applies to welds associated with a range of structural sections and/or plate and/or pipe for general fabrication using ferrous and non-ferrous materials. Weld quality would typically conform to Australian Standard 1554 Structural Purpose, Bureau Det Norse Veritcas or equivalent. Where advanced manual thermal cutting, gouging and shaping is carried out, Unit MEM05008C (Perform advanced manual thermal cutting, gouging and shaping) should also be selected. **Band**: **A** **Unit Weight**: **4**

Licensing/Regulatory Information

Not Applicable

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Pre-Requisites

Prerequisite units		
Path 1	MEM05007C	Perform manual heating and thermal cutting
	MEM05017D	Weld using gas metal arc welding process
	MEM05050B	Perform routine gas metal arc welding
	MEM05051A	Select welding processes
	MEM05052A	Apply safe welding practices
	MEM09002B	Interpret technical drawing
	MEM12023A	Perform engineering measurements
	MEM18001C	Use hand tools
	MEM18002B	Use power tools/hand held operations

Employability Skills Information

Employability skills	This unit contains employability skills.

Elements and Performance Criteria Pre-Content

Elements describe the essential outcomes of a unit of competency.	Performance criteria describe the performance needed to demonstrate achievement of the element. Where bold italicised text is used, further information is detailed in the required skills and knowledge section and the range statement. Assessment of performance is to be consistent with the evidence guide.

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Elements and Performance Criteria

ELEMENT	PERFORMANCE CRITERIA
1. Prepare welding materials and equipment	1.1. Welding equipment is prepared. 1.2. Welding equipment is assembled and adjusted correctly and safely. 1.3. Materials are prepared to achieve required weld specification.
2. Weld joints to code requirements using advanced GMAW	2.1. Weld requirements are interpreted correctly. 2.2. Welds are deposited correctly to specifications. 2.3. Appropriate distortion prevention measures are selected and distortions are rectified as required.
3. Assess weld quality and rectify faults	3.1. Weld joints are visually inspected against specifications. 3.2. Defects are removed using appropriate methods for the given task.. 3.3. Weld records are correctly completed and maintained.

Required Skills and Knowledge

REQUIRED SKILLS AND KNOWLEDGE

This section describes the skills and knowledge required for this unit.

Required skills

Look for evidence that confirms skills in:

- welding to conform to Australian Standard 1554 Structural Purpose, Bureau Det Norse Verticas or equivalent
- performing safe welding practices
- using and applying personal protective equipment for GMAW
- interpreting weld requirements and specifications
- entering information onto proformas and standard workplace forms
- interpreting technical drawings and weld specifications relating to advanced GMAW
- using hand and power tools to prepare and weld material using GMAW
- using measurement and numeracy skills relating to advanced GMAW and preparation
- selecting equipment and consumables appropriate to the task

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REQUIRED SKILLS AND KNOWLEDGE
• using visual identification of faults/defects
Required knowledge
Look for evidence that confirms knowledge of: • in-depth knowledge of the properties and characteristics of a wide range of materials • requirements to conform to Australian Standard 1554 Structural Purpose, Bureau Det Norse Verticas or equivalent • weld procedures and requirements • different welder identification systems such as numbering, bar coding, paint coding, letter stamps • safe welding practices • use and application of personal protective equipment for GMAW

Evidence Guide

EVIDENCE GUIDE	
The evidence guide provides advice on assessment and must be read in conjunction with the performance criteria, required skills and knowledge, range statement and the Assessment Guidelines for the Training Package.	
Overview of assessment	A person who demonstrates competency in this unit must be able to prepare materials, select and set up the welding equipment, carry out advanced GMAW, inspect for and correct defects, and maintain the weld records. Competency in this unit cannot be claimed until all prerequisites have been satisfied.
Critical aspects for assessment and evidence required to demonstrate competency in this unit	Assessors must be satisfied that the candidate can competently and consistently perform all elements of the unit as specified by the criteria, including required knowledge, and be capable of applying the competency in new and different situations and contexts.
Context of and specific resources for assessment	This unit may be assessed on the job, off the job or a combination of both on and off the job. Where assessment occurs off the job, that is the candidate is not in productive work, then an appropriate simulation must be used where the range of conditions reflects realistic workplace situations. The competencies covered by this

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EVIDENCE GUIDE	
	unit would be demonstrated by an individual working alone or as part of a team. The assessment environment should not disadvantage the candidate. This unit could be assessed in conjunction with any other units addressing the safety, quality, communication, materials handling, recording and reporting associated with performing advanced welding using gas metal arc welding process or other units requiring the exercise of the skills and knowledge covered by this unit.
Method of assessment	Assessors should gather a range of evidence that is valid, sufficient, current and authentic. Evidence can be gathered through a variety of ways including direct observation, supervisor's reports, project work, samples and questioning. Questioning techniques should not require language, literacy and numeracy skills beyond those required in this unit of competency. The candidate must have access to all tools, equipment, materials and documentation required. The candidate must be permitted to refer to any relevant workplace procedures, product and manufacturing specifications, codes, standards, manuals and reference materials.
Guidance information for assessment	

Range Statement

RANGE STATEMENT	
The range statement relates to the unit of competency as a whole. It allows for different work environments and situations that may affect performance. Bold italicised wording, if used in the performance criteria, is detailed below. Essential operating conditions that may be present with training and assessment (depending on the work situation, needs of the candidate, accessibility of the item, and local industry and regional contexts) may also be included.	
Welding equipment	AC or DC welding machines, settings, electrodes and related equipment
Preparing materials	Preheating, setting up of jigs, fixtures, clamps, etc., joint preparation e.g. bevelling

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RANGE STATEMENT	
Materials	Low carbon, cast iron, stainless and low alloy steel, aluminium and aluminium alloys
Welds	Fillet and butt in all positions
Distortion prevention measures	Preheating, setting up of jigs, fixtures, clamps, etc.
Defects	Porosity, slag inclusions, discontinuities, lack of penetration, undercut
Appropriate methods	Oxy acetylene arc equipment, grinding devices
Weld records	Proformas and other standard workplace forms

Unit Sector(s)

Unit sector	

Co-requisite units

Co-requisite units		

Competency field

Competency field	Fabrication

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MEM05019D Weld using gas tungsten arc welding process

Modification History

Not Applicable

Unit Descriptor

Unit descriptor	This unit of competency covers the preparation, positioning, fixing, and welding techniques associated with general trade level welding using gas tungsten arc welding (GTAW) equipment including the selection and set up of the equipment appropriate to both the material and the weld to be performed, carrying out the GTAW to prescribed standards, and examining for and correcting defects, in a range of welded fabrications.

Application of the Unit

Application of the unit	This unit of competency applies to welds associated with heavy or light metal fabrications. Welds are fillet and butt welds in all positions on a range of ferrous and non-ferrous materials that may include carbon steel or stainless steel and aluminium. Weld quality would conform to Australian Standard 1554 General Purpose, American Bureau of Shipping (ABS), or equivalent. This unit has been primarily developed to support Engineering Tradesperson - Fabrication apprenticeship training and the recognition of trade level skills in GTAW. It may also apply to other trade occupations requiring higher level GTAW welding skills. Where manual thermal processes associated with preparation, pre-heat and/or post-heat are required, MEM05007C Perform manual heating and thermal cutting and/or MEM05008C Perform advanced manual thermal cutting, gouging and shaping should be considered for selection. **Band**: **A** **Unit Weight**: **4**

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Licensing/Regulatory Information

Not Applicable

Pre-Requisites

Prerequisite units		
Path 1	MEM05049B	Perform routine gas tungsten arc welding
	MEM05051A	Select welding processes
	MEM05052A	Apply safe welding practices
	MEM12023A	Perform engineering measurements
	MEM18001C	Use hand tools
	MEM18002B	Use power tools/hand held operations

Employability Skills Information

Employability skills	This unit contains employability skills.

Elements and Performance Criteria Pre-Content

Elements describe the essential outcomes of a unit of competency.	Performance criteria describe the performance needed to demonstrate achievement of the element. Where bold italicised text is used, further information is detailed in the required skills and knowledge section and the range statement. Assessment of performance is to be consistent with the evidence guide.

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Elements and Performance Criteria

ELEMENT	PERFORMANCE CRITERIA
1. Prepare materials for gas tungsten arc welding (GTAW)	1.1. Weld requirements are identified from specifications and/or drawings 1.2. Material is correctly prepared 1.3. Materials are assembled/aligned to specification, where required
2. Select welding equipment and consumables	2.1. Welding equipment and electrodes, accessories and consumables appropriate to the material are identified and selected
3. Assemble and set up welding equipment	3.1. Welding equipment is assembled and set up
4. Minimise and rectify distortion	4.1. Appropriate distortion prevention measures for weld and material type are selected and applied 4.2. Distortion is rectified
5. Weld to job specification using GTAW	5.1. Weld deposit is to specifications 5.2. Joints are cleaned to specifications
6. Ensure weld conformance	6.1. Defects are removed with minimum loss of sound metal using techniques and tools appropriate to the defect, material and process 6.2. Weld joints are visually inspected for conformance to specifications
7. Maintain weld records as required	7.1. Weld records are completed correctly

Required Skills and Knowledge

REQUIRED SKILLS AND KNOWLEDGE
This section describes the skills and knowledge required for this unit.
Required skills
Required skills include: • identifying and interpreting welding specifications including appropriate standards e.g. Australian Standard 1554 General Purpose, American Bureau of Shipping (ABS) or equivalent • selecting and using appropriate tools and equipment

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REQUIRED SKILLS AND KNOWLEDGE
• using a variety of welding machines and electrodes • identifying and rectifying weld defects • applying techniques for distortion prevention and rectification • cleaning welds • reading and interpreting information on sketches, written job instructions, specifications, standard operating procedures and engineering drawings • recording routine information including routine weld records related to GTAW onto proformas and standard workplace forms • following oral instructions • measurement skills relating to joint preparation and GTAW
Required knowledge
Required knowledge includes: • correct welding machine, leads, hand pieces and electrodes • material preparation • joint preparations • electrode classification • causes of distortion for materials within the scope of this unit • causes of defects and methods of rectification • the relationships between amperage, electrode and material • types of gases and their uses • types of electrodes, current settings and high frequency voltage • filler materials and consumables • safe welding practices • use and application of personal protective equipment for GTAW

Evidence Guide

EVIDENCE GUIDE	
The evidence guide provides advice on assessment and must be read in conjunction with the performance criteria, required skills and knowledge, range statement and the Assessment Guidelines for the Training Package.	
Overview of assessment	A person who demonstrates competency in this unit must be able to prepare materials, select and set up the welding equipment, carry out the GTAW welding and examine for and correct defects, in a range of welding activities associated with GTAW. Competency in this unit cannot

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EVIDENCE GUIDE	
	be awarded until all prerequisites have been satisfied.
Critical aspects for assessment and evidence required to demonstrate competency in this unit	Assessors must be satisfied that the candidate can competently and consistently apply the skills covered in this unit of competency in new and different workplace situations and contexts. Critical aspects of assessment and evidence include: • following all safety procedures to protect self, other workers and members of the public • identifying and interpreting specifications for GTAW including Australian Standard 1554 General Purpose • interpreting welding specifications including standard welding symbols used to show weld procedure • selecting appropriate weld preparation methods for material and position of welds. • preparing materials, setting up of jigs, fixtures, clamps,etc. and joint preparation including bevelling • consistently welding different ferrous and non-ferrous materials to AS 1554 General Purpose or equivalent • identifying defects as described in the range statement across a range of welded materials • rectifying defects.
Context of and specific resources for assessment	Welding to AS 1554 General Purpose or equivalent requires both theoretical knowledge and high practical skills. The assessment process must be designed to identify consistent performance to standard and specification across a range of materials and positions. The assessment must also identify a level of workplace performance in terms of defect rate and weld failure rates. It is recommended that assessment involve demonstrations of competency under both workshop and site conditions. This means that the ideal assessment environment is either on the job or a combination of both on and off the job. The competencies covered by this unit may be demonstrated by an individual working alone or as part of a team. The assessment environment should not disadvantage the candidate.
Method of assessment	Typically an Engineering Tradesperson - Fabrication and other tradespersons engaged in welding are required to exercise GTAW skills and techniques across a range of

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EVIDENCE GUIDE	
	jobs and specifications. A single assessment event is not appropriate. On the job assessment should be included as part of the assessment process wherever possible. Where assessment occurs off the job, judgement must consider evidence of the candidate's performance in a productive work environment that includes a sufficient range of appropriate tasks and materials to cover the scope of application for this unit. Assessors should gather a range of evidence that is valid, sufficient, current and authentic. Evidence can be gathered through a variety of ways including direct observation, supervisor's reports, project work, samples and questioning. Questioning techniques should not require language, literacy and numeracy skills beyond those required in this unit of competency. The candidate must have access to all tools, equipment, materials and documentation required. The candidate must be permitted to refer to any relevant workplace procedures, product and manufacturing specifications, codes, standards, manuals and reference materials.
Guidance information for assessment	This unit could be assessed in conjunction with any other units addressing the safety, quality, communication, materials handling, recording and reporting associated with welding using GTAW process or other units requiring the exercise of the skills and knowledge covered by this unit. Assessors must be satisfied that the candidate can competently and consistently perform all elements of the unit as specified by the criteria, including required knowledge, and be capable of applying the competency in new and different situations and contexts.

Range Statement

RANGE STATEMENT
The range statement relates to the unit of competency as a whole. It allows for different work environments and situations that may affect performance. Bold italicised wording, if used in the performance criteria, is detailed below. Essential operating

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RANGE STATEMENT	
conditions that may be present with training and assessment (depending on the work situation, needs of the candidate, accessibility of the item, and local industry and regional contexts) may also be included.	
Prepared	Prepared may include: • pre-heating • setting up of jigs, fixtures and clamps • joint preparation (e.g. bevelling)
Welds	Welds include fillet and butt welds carried out in all positions
Materials	Materials may include ferrous and non-ferrous materials including carbon steel,stainless steel, aluminium and other materials suitable for GTAW welding
Welding equipment	Welding equipment may include AC or DC welding machines
Distortion prevention measures	Distortion prevention measures may include: • pre-heating • setting up of jigs, fixtures and clamps
Rectified	Rectified may include: • oxy acetylene and air arc equipment • grinding devices
Defects	Defects may include: • porosity • slag inclusions • discontinuities • lack of penetration • undercut

Unit Sector(s)

Unit sector	

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Co-requisite units

Co-requisite units		

Competency field

Competency field	Fabrication

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MEM05020C Perform advanced welding using gas tungsten arc welding process

Modification History

Not Applicable

Unit Descriptor

Unit descriptor	This unit covers preparing materials, selecting and setting up the welding equipment, carrying out advanced gas tungsten arc welding (GTAW), inspecting for and correcting defects, and maintaining the weld records.

Application of the Unit

Application of the unit	This unit applies to welds associated with a range of structural sections and/or plate and/or pipe for general fabrication. Weld quality would typically conform to Australian Standard 1554 Structural Purpose, Bureau Det Norse Verticas or equivalent. **Band**: **A** **Unit Weight**: **4**

Licensing/Regulatory Information

Not Applicable

Pre-Requisites

Prerequisite units		
Path 1	MEM05007C	Perform manual heating and thermal cutting

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Prerequisite units		
	MEM05019D	Weld using gas tungsten arc welding process
	MEM05049B	Perform routine gas tungsten arc welding
	MEM05051A	Select welding processes
	MEM05052A	Apply safe welding practices
	MEM09002B	Interpret technical drawing
	MEM12023A	Perform engineering measurements
	MEM18001C	Use hand tools
	MEM18002B	Use power tools/hand held operations

Employability Skills Information

Employability skills	This unit contains employability skills.

Elements and Performance Criteria Pre-Content

Elements describe the essential outcomes of a unit of competency.	Performance criteria describe the performance needed to demonstrate achievement of the element. Where bold italicised text is used, further information is detailed in the required skills and knowledge section and the range statement. Assessment of performance is to be consistent with the evidence guide.

Elements and Performance Criteria

ELEMENT	**PERFORMANCE CRITERIA**

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ELEMENT	PERFORMANCE CRITERIA
1. Prepare welding materials and equipment	1.1. Welding equipment is prepared. 1.2. Welding equipment appropriate to task requirements is assembled and adjusted correctly and safely. 1.3. Materials are prepared to achieve the required weld specification.
2. Weld joints to code requirements using advanced GTAW	2.1. Weld requirements are interpreted correctly, 2.2. Welds are deposited correctly to specifications. 2.3. Appropriate distortion prevention measures are selected for the weld type and material and distortions are rectified as required.
3. Assess weld quality and rectify faults	3.1. Weld joints are visually inspected against specifications. 3.2. Defects are removed using appropriate methods for the given task. 3.3. Weld records are correctly completed and maintained.

Required Skills and Knowledge

REQUIRED SKILLS AND KNOWLEDGE

This section describes the skills and knowledge required for this unit.

Required skills

Look for evidence that confirms skills in:

- welding to conform to Australian Standard 1554 Structural Purpose, Bureau Det Norse Verticas or equivalent
- interpreting technical drawings and weld specifications relating to advanced GTAW
- using hand and power tools to prepare and weld material using GTAW
- using measurement and numeracy skills relating to advanced GTAW and preparation
- selecting equipment and consumables appropriate to task
- using visual identification of faults/defects

Required knowledge

Look for evidence that confirms knowledge of:

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REQUIRED SKILLS AND KNOWLEDGE
• in-depth knowledge of the properties and characteristics of a wide range of materials • requirements to conform to Australian Standard 1554 Structural Purpose, Bureau Det Norse Verticas or equivalent • weld procedures and requirements • different welder identification systems such as numbering, bar coding, paint coding, letter stamps • safe welding practices • use and application of personal protective equipment for GTAW • hazards and control measures related to GTAW

Evidence Guide

EVIDENCE GUIDE	
The evidence guide provides advice on assessment and must be read in conjunction with the performance criteria, required skills and knowledge, range statement and the Assessment Guidelines for the Training Package.	
Overview of assessment	A person who demonstrates competency in this unit must be able to prepare materials, select and set up the welding equipment, carry out the GTAW welding and inspect for and correct defects and maintain welding records. Competency in this unit cannot be claimed until all prerequisites have been satisfied.
Critical aspects for assessment and evidence required to demonstrate competency in this unit	Assessors must be satisfied that the candidate can competently and consistently perform all elements of the unit as specified by the criteria, including required knowledge, and be capable of applying the competency in new and different situations and contexts.
Context of and specific resources for assessment	This unit may be assessed on the job, off the job or a combination of both on and off the job. Where assessment occurs off the job, that is the candidate is not in productive work, then an appropriate simulation must be used where the range of conditions reflects realistic workplace situations. The competencies covered by this unit would be demonstrated by an individual working alone or as part of a team. The assessment environment should not disadvantage the candidate.

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EVIDENCE GUIDE	
	This unit could be assessed in conjunction with any other units addressing the safety, quality, communication, materials handling, recording and reporting associated with performing advanced welding using gas tungsten arc welding process (GTAW) or other units requiring the exercise of the skills and knowledge covered by this unit.
Method of assessment	Assessors should gather a range of evidence that is valid, sufficient, current and authentic. Evidence can be gathered through a variety of ways including direct observation, supervisor's reports, project work, samples and questioning. Questioning techniques should not require language, literacy and numeracy skills beyond those required in this unit of competency. The candidate must have access to all tools, equipment, materials and documentation required. The candidate must be permitted to refer to any relevant workplace procedures, product and manufacturing specifications, codes, standards, manuals and reference materials.
Guidance information for assessment	

Range Statement

RANGE STATEMENT	
The range statement relates to the unit of competency as a whole. It allows for different work environments and situations that may affect performance. Bold italicised wording, if used in the performance criteria, is detailed below. Essential operating conditions that may be present with training and assessment (depending on the work situation, needs of the candidate, accessibility of the item, and local industry and regional contexts) may also be included.	
Equipment	AC or DC welding machines, gases, settings, electrodes and related equipment
Materials	Low carbon, cast iron, stainless and low alloy steel, aluminium
Prepared	Preheating, setting up of jigs, fixtures, clamps, etc., joint preparation e.g. bevelling

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RANGE STATEMENT	
Welds	Fillet and butt in all positions
Distortion prevention measures	Preheating, setting up of jigs, fixtures, clamps, etc.
Defects	Porosity, slag inclusions, discontinuities, lack of penetration, undercut
Appropriate methods	Oxy acetylene, air arc equipment and grinding devices
Weld records	Proformas and other standard workplace forms

Unit Sector(s)

Unit sector	

Co-requisite units

Co-requisite units		

Competency field

Competency field	Fabrication

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MEM05022C Perform advanced welding using oxy acetylene welding process

Modification History

Not Applicable

Unit Descriptor

Unit descriptor	This unit covers performing advanced oxy acetylene welding, carried out using a range of materials for general fabrication.

Application of the Unit

Application of the unit	This unit applies to comprehensive preparation as required in a range of environments. It also includes maintaining weld records and rectifying defects. The term 'oxy acetylene' is used here to describe a range of fuel gases, including acetylene, LPG, hydrogen etc. This unit covers the competencies required for welding quality that would meet the Australian Standard 1554 Special Purpose, appropriate industrial standards, or equivalent outcomes. Where welds comply with one of the certificates covered by Australian Standard 1796, then Unit MEM05026C (Apply welding principles) should also be selected. Where advanced manual thermal cutting, gouging and shaping is carried out, Unit MEM05008C (Perform advanced manual thermal cutting, gouging and shaping) should also be selected. **Band**: **A** **Unit Weight**: **6**

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Licensing/Regulatory Information

Not Applicable

Pre-Requisites

Prerequisite units		
Path 1	MEM05004C	Perform routine oxy acetylene welding
	MEM05007C	Perform manual heating and thermal cutting
	MEM05051A	Select welding processes
	MEM05052A	Apply safe welding practices
	MEM09002B	Interpret technical drawing
	MEM18001C	Use hand tools
	MEM18002B	Use power tools/hand held operations

Employability Skills Information

Employability skills	This unit contains employability skills.

Elements and Performance Criteria Pre-Content

Elements describe the essential outcomes of a unit of competency.	Performance criteria describe the performance needed to demonstrate achievement of the element. Where bold italicised text is used, further information is detailed in the required skills and knowledge section and the range statement. Assessment of performance is to be consistent with the evidence guide.

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Elements and Performance Criteria

ELEMENT	PERFORMANCE CRITERIA
1. Select welding equipment and consumables	1.1. Correct welding equipment and consumables are selected from weld procedure specifications.
2. Prepare welding materials and equipment	2.1. Welding equipment and consumables are prepared according to job requirements. 2.2. Welding equipment appropriate to the task is assembled and adjusted correctly and safely. 2.3. Materials are prepared to achieve required weld specification.
3. Assemble welding equipment	3.1. Welding equipment, including cylinders, regulators, hoses, torches and tips is assembled and set up safely in accordance with standard operating procedures.
4. Weld joints to Australian Standard 1554 SP or equivalent	4.1. Materials are welded to Australian Standard 1554 SP or equivalent in all positions. 4.2. Instructions, symbols, specifications are interpreted correctly including bead size, bead placement, reinforcement etc. and in accordance with weld procedure sheet, if available, and standard operating procedures.
5. Inspect welds	5.1. Weld joints are visually inspected against specifications. 5.2. Weld defects are identified.
6. Correct faults	6.1. Defects are removed with minimum loss of sound metal using correct and appropriate techniques and tools to Australian Standard 3992 or equivalent.
7. Maintain weld records	7.1. Weld records are maintained in accordance with specifications and standard operating procedures.

Required Skills and Knowledge

REQUIRED SKILLS AND KNOWLEDGE
This section describes the skills and knowledge required for this unit.
Required skills
Look for evidence that confirms skills in:

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REQUIRED SKILLS AND KNOWLEDGE
• selecting equipment and consumables • assembling welding equipment • welding to AS1554 SP • inspecting welds to specification • correcting weld faults to AS3992 • entering information on to proformas and standard workplace forms • using hand and power tools to prepare and weld materials • interpreting weld requirements and specifications/procedures • using measurement and numeracy skills for advanced oxy acetylene welding • selecting equipment and consumables appropriate to given task • using visual identification of defects/faults
Required knowledge
Look for evidence that confirms knowledge of: • preparatory requirements • the purpose and examples of pre-welding and post-welding heating of the weld materials • the appropriate settings for the given task and the selected equipment/consumables • the purpose of reinforcing areas to be welded • the methods of weld defect removal and their application • material and consumable properties and characteristics • requirements of AS1554SP and AS3992 or equivalent • fuel gas properties and applications • post treatments • recording procedures • safe welding practices • use and application of personal protective equipment for oxy acetylene welding • relevant hazards and control measures related to the competency

Evidence Guide

EVIDENCE GUIDE	
The evidence guide provides advice on assessment and must be read in conjunction with the performance criteria, required skills and knowledge, range statement and the Assessment Guidelines for the Training Package.	
Overview of assessment	A person who demonstrates competency in this unit must

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EVIDENCE GUIDE	
	be able to perform advanced oxy acetylene welding carried out using a range of materials for general fabrication. Competency in this unit cannot be claimed until all prerequisites have been satisfied.
Critical aspects for assessment and evidence required to demonstrate competency in this unit	Assessors must be satisfied that the candidate can competently and consistently perform all elements of the unit as specified by the criteria, including required knowledge, and be capable of applying the competency in new and different situations and contexts.
Context of and specific resources for assessment	This unit may be assessed on the job, off the job or a combination of both on and off the job. Where assessment occurs off the job, that is the candidate is not in productive work, then an appropriate simulation must be used where the range of conditions reflects realistic workplace situations. The competencies covered by this unit would be demonstrated by an individual working alone or as part of a team. The assessment environment should not disadvantage the candidate. This unit could be assessed in conjunction with any other units addressing the safety, quality, communication, materials handling, recording and reporting associated with performing advanced welding using oxy acetylene welding process or other units requiring the exercise of the skills and knowledge covered by this unit.
Method of assessment	Assessors should gather a range of evidence that is valid, sufficient, current and authentic. Evidence can be gathered through a variety of ways including direct observation, supervisor's reports, project work, samples and questioning. Questioning techniques should not require language, literacy and numeracy skills beyond those required in this unit of competency. The candidate must have access to all tools, equipment, materials and documentation required. The candidate must be permitted to refer to any relevant workplace procedures, product and manufacturing specifications, codes, standards, manuals and reference materials.
Guidance information for assessment	

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Range Statement

RANGE STATEMENT	
The range statement relates to the unit of competency as a whole. It allows for different work environments and situations that may affect performance. Bold italicised wording, if used in the performance criteria, is detailed below. Essential operating conditions that may be present with training and assessment (depending on the work situation, needs of the candidate, accessibility of the item, and local industry and regional contexts) may also be included.	
Equipment and consumables	Fuel gases, including acetylene, LPG, hydrogen etc., cylinders, regulators, hoses, torches, tips, range of filler rods and fluxes
Weld	Fillet and butt in the horizontal, vertical and overhead positions
Preparing materials	Preheating, setting up of jigs, fixtures, clamps, etc., joint preparation e.g. bevelling
Materials	Low carbon steel, plate, pipe, tube and round bar

Unit Sector(s)

Unit sector	

Co-requisite units

Co-requisite units		

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Competency field

Competency field	Fabrication

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MEM05024B Perform welding supervision

Modification History

Not Applicable

Unit Descriptor

Unit descriptor	This unit covers instructing and qualifying welders in accordance with weld procedures, and maintaining quality and safety procedures.

Application of the Unit

Application of the unit	Competencies in this unit are based on wide knowledge of welding science, processes, procedures and technical requirements. Individuals working in this field would hold at least one certificate satisfying the requirements of Australian Standard 1796 Certificate 1-9. The supervision, training and qualification of welders in welding procedures is defined by recognised codes and standards e.g. Australian Standard 2214 and Australian Standard 1796 Certificate 10. **Band**: **B** **Unit Weight**: **12**

Licensing/Regulatory Information

Not Applicable

Pre-Requisites

Prerequisite units		
Path 1	MEM05026C	Apply welding principles

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Prerequisite units		

Employability Skills Information

Employability skills	This unit contains employability skills.

Elements and Performance Criteria Pre-Content

Elements describe the essential outcomes of a unit of competency.	Performance criteria describe the performance needed to demonstrate achievement of the element. Where bold italicised text is used, further information is detailed in the required skills and knowledge section and the range statement. Assessment of performance is to be consistent with the evidence guide.

Elements and Performance Criteria

ELEMENT	**PERFORMANCE CRITERIA**
1. Determine and prepare welding procedure	1.1. Welders are instructed according to procedure. 1.2. Welding parameters are determined in accordance with procedures 1.3. Variables and sequence checks are planned against documentation. 1.4. Documentation is prepared for record keeping.
2. Qualify welders to required procedures	2.1. Welders are trained in relevant procedures. 2.2. Welders are tested against relevant procedures. 2.3. Welder performance reports against procedures are maintained.
3. Monitor/maintain quality assurance and safety procedures	3.1. Internal quality assurance plan is monitored. 3.2. Traceability of materials is ensured. 3.3. Welding is supervised to ensure compliance with prescribed specifications and/or documented

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ELEMENT	PERFORMANCE CRITERIA
	procedures and/or safety procedures.
4. Prepare documents	4.1. Procedure is recorded against pre-qualifying procedures. 4.2. Findings on internal quality assurance plan are recorded.
5. Arrange for non-destructive testing and destructive testing	5.1. Weld tests appropriate to the weld procedure are arranged. 5.2. Non-destructive testing/destructive testing reports are verified against job requirements and specifications.

Required Skills and Knowledge

REQUIRED SKILLS AND KNOWLEDGE

This section describes the skills and knowledge required for this unit.

Required skills

Look for evidence that confirms skills in:

- individuals working in this field would hold at least one certificate satisfying the requirements of Australian Standard 1796 Certificate 1-9.
- welding to the procedure being supervised
- providing training to welders on welding procedures
- communicating to welders on welding requirements
- planning of weld procedures
- writing workplace welding procedures, recording information on proformas and other workplace documents/reports

Required knowledge

Look for evidence that confirms knowledge of:

- welding science, principles and effects of heat treatment
- welding terms, codes and symbols
- welding processes, parameters and relation to weld quality
- welding procedures defined by code and technical requirements
- non-destructive testing
- any applicable industry standards, national/Australian standards, NOHSC guides, State/Territory regulatory codes of practice/standards

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REQUIRED SKILLS AND KNOWLEDGE
• use and application of personal protective equipment for welding supervision • safe work practices and procedures

Evidence Guide

EVIDENCE GUIDE	
The evidence guide provides advice on assessment and must be read in conjunction with the performance criteria, required skills and knowledge, range statement and the Assessment Guidelines for the Training Package.	
Overview of assessment	A person who demonstrates competency in this unit must be able to provide appropriate supervision to welding tasks and outcomes. Competency in this unit cannot be claimed until all prerequisites have been satisfied.
Critical aspects for assessment and evidence required to demonstrate competency in this unit	Assessors must be satisfied that the candidate can competently and consistently perform all elements of the unit as specified by the criteria, including required knowledge, and be capable of applying the competency in new and different situations and contexts.
Context of and specific resources for assessment	This unit may be assessed on the job, off the job or a combination of both. Where assessment occurs off the job, that is the candidate is not in productive work, appropriate simulation must be used where the range of conditions reflects realistic workplace situations. The competencies covered by this unit would be demonstrated by an individual working alone or as part of a team. The assessment environment should not disadvantage the candidate. This unit could be assessed in conjunction with any other units addressing the safety, quality, communication, materials handling, recording and reporting associated with applying a wide knowledge of welding science, processes, procedures and technical requirements to the supervision process or other units requiring the exercise of the skills and knowledge covered by this unit.
Method of assessment	Assessors should gather a range of evidence that is valid, sufficient, current and authentic. Evidence can be gathered through a variety of ways including direct

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EVIDENCE GUIDE	
	observation, supervisor's reports, project work, samples and questioning. Questioning should not require language, literacy and numeracy skills beyond those required in this unit. The candidate must have access to all tools, equipment, materials and documentation required. The candidate must be permitted to refer to any relevant workplace procedures, product and manufacturing specifications, codes, standards, manuals and reference materials.
Guidance information for assessment	

Range Statement

RANGE STATEMENT	
The range statement relates to the unit of competency as a whole. It allows for different work environments and situations that may affect performance. Bold italicised wording, if used in the performance criteria, is detailed below. Essential operating conditions that may be present with training and assessment (depending on the work situation, needs of the candidate, accessibility of the item, and local industry and regional contexts) may also be included.	
Procedure	As defined by the relevant codes and/or standards
Documentation	As defined by the relevant codes and/or standards
Traceability	The materials used in a nominated weld can be traced to their source in accordance with standard operating procedures

Unit Sector(s)

Unit sector	

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Co-requisite units

Co-requisite units		

Competency field

Competency field	Fabrication

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MEM05026C Apply welding principles

Modification History

Single band identifier removed to clarify dual status

Unit Descriptor

Unit descriptor	This unit of competency covers applying welding principles to meet the statutory and regulatory requirements for welding procedures generally associated with the application of one of the units satisfying Australian Standard 1796 Certificates 1-9.

Application of the Unit

Application of the unit	This unit of competency covers the underpinning knowledge required to satisfy Australian Standard 1796. It includes knowledge of welding terms, codes and symbols, the effects of heat treatment on metal as it relates to welding, and the logical sequence for a welding process required to be conducted to AS 1796. It covers welding, planning and set up principles for a range of materials and processes. This unit must be assessed in combination with one of the units satisfying the Australian Standard 1796 Certificates 1-9 and these units include: • MEM05042B Perform welds to code standards using flux core arc welding process • MEM05043B Perform welds to code standards using gas metal arc welding process • MEM05044B Perform welds to code standards using gas tungsten arc welding process • MEM05045B Perform pipe welds to code standards using manual metal arc welding process • MEM05046B Perform welds to code standards using manual metal arc welding process. This unit has been developed for Engineering Tradespersons - Fabrication in either apprenticeship or post trade training and the recognition of trade level

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	knowledge of welding principles. **Band:** This unit has dual status and is to be regarded as both a Specialisation Band A unit and Specialisation Band B unit for progression to C7 (AQF level IV). **Unit Weight**: **4**

Licensing/Regulatory Information

Not Applicable

Pre-Requisites

Prerequisite units		

Employability Skills Information

Employability skills	This unit contains employability skills.

Elements and Performance Criteria Pre-Content

Elements describe the essential outcomes of a unit of competency.	Performance criteria describe the performance needed to demonstrate achievement of the element. Where bold italicised text is used, further information is detailed in the required skills and knowledge section and the range statement. Assessment of performance is to be consistent with the evidence guide.

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Elements and Performance Criteria

ELEMENT	PERFORMANCE CRITERIA
1. Apply all statutory and regulatory requirements to welding procedures	1.1. Statutory and safety requirements are applied to welding
2. Interpret all welding terms, codes and symbols	2.1. Welding terms and symbols are correctly interpreted
3. Determine the effects of heat treatment on metal in relation to welding	3.1. Reasons for performing heat treatment are identified 3.2. Processes such as pre-heat/post-heat treatment, stress relieving, normalising and annealing are appropriately applied
4. Plan the logical sequence of welding operations	4.1. Principles of planning and setting up welding are applied 4.2. Where specified, welds are prepared for testing

Required Skills and Knowledge

REQUIRED SKILLS AND KNOWLEDGE

This section describes the skills and knowledge required for this unit.

Required skills

Required skills include:

- interpreting welding specifications including terms, codes and symbols
- planning the sequence of welding operations

Required knowledge

Required knowledge includes:

- any applicable industry standards, national/Australian standards, NOHSC guidelines, state/territory regulatory codes of practice/standards for the applicable welding processes
- safe work practices and procedures
- hazards related to welding
- safety equipment and procedures related to welding activities
- welding terminology
- welding codes and symbols

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REQUIRED SKILLS AND KNOWLEDGE
• heat treatment processes • logical sequence for welding processes • tools, equipment, techniques used in welding • effect of heat treatment on metal

Evidence Guide

EVIDENCE GUIDE	
The evidence guide provides advice on assessment and must be read in conjunction with the performance criteria, required skills and knowledge, range statement and the Assessment Guidelines for the Training Package.	
Overview of assessment	A person who demonstrates competency in this unit must be able to apply welding principles to meet the statutory and regulatory requirements for welding procedures.
Critical aspects for assessment and evidence required to demonstrate competency in this unit	Assessors must be satisfied that the candidate can competently and consistently apply the skills and knowledge covered in this unit of competency in new and different workplace situations and contexts. Critical aspects of assessment and evidence include: • applying welding statutory and safety requirements to different welding jobs and environments • interpreting welding codes and symbols including symbols for type of weld, weld size, processing and finishing operations etc • applying appropriate pre and post-heat treatment processes for a range of welded materials • setting up weld sequence and preparing materials in a logical manner for welding job.
Context of and specific resources for assessment	This unit must be assessed in combination with one of the units satisfying the Australian Standard 1796 Certificates 1-9. Welding to AS 1796 requires both theoretical knowledge and high practical skills. The assessment process for the two units must be designed to identify consistent performance to the tandards, the code and specifications across a range of materials and positions. The assessment must also identify a workplace level of performance in terms of defect rates and weld

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EVIDENCE GUIDE	
	failure rates. It is recommended that assessment involve demonstrations of competency under both workshop and site conditions. This means that the ideal assessment environment is either on the job or a combination of both on and off the job. The competencies covered by this unit would be demonstrated by an individual working alone or as part of a team. The assessment environment should not disadvantage the candidate.
Method of assessment	Typically an Engineering Tradesperson - Fabrication and other tradespersons engaged in welding are required to apply welding principles and techniques across a range of jobs and specifications. A single assessment event is not appropriate. On the job assessment should be included as part of the assessment process wherever possible. Where assessment occurs off the job, judgement must consider evidence of the candidate's performance in a productive work environment that includes a sufficient range of appropriate tasks and materials to cover the scope of application for this unit. Assessors should gather a range of evidence that is valid, sufficient, current and authentic. Evidence can be gathered through a variety of ways including direct observation, supervisor's reports, project work, samples and questioning. Questioning techniques should not require language, literacy and numeracy skills beyond those required in this unit of competency. The candidate must have access to all tools, equipment, materials and documentation required. The candidate must be permitted to refer to any relevant workplace procedures, product and manufacturing specifications, codes, standards, manuals and reference materials.
Guidance information for assessment	This unit must be assessed in combination with one of the units satisfying the Australian Standard 1796 Certificate 1-9 and these units include: • MEM05042B Perform welds to code standards using flux core arc welding process • MEM05043B Perform welds to code standards using gas metal arc welding process • MEM05044B Perform welds to code standards using gas tungsten arc welding process

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EVIDENCE GUIDE	
	• MEM05045B Perform pipe welds to code standards using manual metal arc welding process • MEM05046B Perform welds to code standards using manual metal arc welding process. This unit could also be assessed in conjunction with any other units addressing the safety, quality, communication materials handling, recording and reporting associated with applying welding principles to meet the statutory and regulatory requirements for welding procedures or other units requiring the exercise of the skills and knowledge covered by this unit. Assessors must be satisfied that the candidate can competently and consistently perform all elements of the unit as specified by the criteria, including required knowledge, and be capable of applying the competency in new and different situations and contexts.

Range Statement

RANGE STATEMENT	
The range statement relates to the unit of competency as a whole. It allows for different work environments and situations that may affect performance. Bold italicised wording, if used in the performance criteria, is detailed below. Essential operating conditions that may be present with training and assessment (depending on the work situation, needs of the candidate, accessibility of the item, and local industry and regional contexts) may also be included.	
Statutory and safety requirements	Statutory and safety requirements as required by AS 1796 welding codes
Welding	Welding to AS 1796 using any of the following processes: • flux core arc welding • gas metal arc welding • gas tungsten arc welding • manual metal arc welding

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Unit Sector(s)

Unit sector	

Co-requisite units

Co-requisite units		

Competency field

Competency field	Fabrication

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MEM05036C Repair/replace/modify fabrications

Modification History

Not Applicable

Unit Descriptor

Unit descriptor	This unit covers assessing task requirements; preparing materials; undertaking the repair, replacement or modification of the fabrication; cleaning and finishing to specifications; and inspecting the result.

Application of the Unit

Application of the unit	This unit requires an integrated level of skills in fabrication maintenance and repair. This unit is intended to build on skills covered by the specialist prerequisites. Processes may involve the simple mark out of materials, and the setting up and operation of a variety of welding and cutting plant/equipment. If individual skills are required, relevant specialist units only should be selected. Where additional or more complex marking out skills are required, refer to Unit MEM12007D (Mark off/out structural fabrications and shapes). If machines and equipment for forming, bending or shaping are required, Unit MEM05010C (Apply fabrication, forming and shaping techniques) should also be selected. **Band**: **A** **Unit Weight**: **4**

Licensing/Regulatory Information

Not Applicable

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Pre-Requisites

Prerequisite units		
Path 1	MEM05005B	Carry out mechanical cutting
	MEM05007C	Perform manual heating and thermal cutting
	MEM05011D	Assemble fabricated components
	MEM05012C	Perform routine manual metal arc welding
	MEM05015D	Weld using manual metal arc welding process
	MEM05051A	Select welding processes
	MEM05052A	Apply safe welding practices
	MEM09002B	Interpret technical drawing
	MEM12023A	Perform engineering measurements
	MEM18001C	Use hand tools
	MEM18002B	Use power tools/hand held operations
Path 2	MEM05005B	Carry out mechanical cutting
	MEM05007C	Perform manual heating and thermal cutting
	MEM05011D	Assemble fabricated components
	MEM05017D	Weld using gas metal arc welding process
	MEM05050B	Perform routine gas metal arc welding
	MEM05051A	Select welding processes
	MEM05052A	Apply safe welding practices
	MEM09002B	Interpret technical drawing

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Prerequisite units		
	MEM12023A	Perform engineering measurements
	MEM18001C	Use hand tools
	MEM18002B	Use power tools/hand held operations
Path 3	MEM05004C	Perform routine oxy acetylene welding
	MEM05005B	Carry out mechanical cutting
	MEM05007C	Perform manual heating and thermal cutting
	MEM05011D	Assemble fabricated components
	MEM05022C	Perform advanced welding using oxy acetylene welding process
	MEM05051A	Select welding processes
	MEM05052A	Apply safe welding practices
	MEM09002B	Interpret technical drawing
	MEM12023A	Perform engineering measurements
	MEM18001C	Use hand tools
	MEM18002B	Use power tools/hand held operations
Path 4	MEM05005B	Carry out mechanical cutting
	MEM05007C	Perform manual heating and thermal cutting
	MEM05011D	Assemble fabricated components
	MEM05019D	Weld using gas tungsten arc welding process
	MEM05049B	Perform routine gas tungsten arc welding
	MEM05051A	Select welding processes

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Prerequisite units		
	MEM05052A	Apply safe welding practices
	MEM09002B	Interpret technical drawing
	MEM12023A	Perform engineering measurements
	MEM18001C	Use hand tools
	MEM18002B	Use power tools/hand held operations

Employability Skills Information

Employability skills	This unit contains employability skills.

Elements and Performance Criteria Pre-Content

Elements describe the essential outcomes of a unit of competency.	Performance criteria describe the performance needed to demonstrate achievement of the element. Where bold italicised text is used, further information is detailed in the required skills and knowledge section and the range statement. Assessment of performance is to be consistent with the evidence guide.

Elements and Performance Criteria

ELEMENT	**PERFORMANCE CRITERIA**
1. Assess and process repair, replacement, modification requirement	1.1. Work requirements are determined from job sheet, instruction or visual inspection. 1.2. Specifications and drawings are obtained and interpreted where required. 1.3. Fabrication is inspected and suitability for repair/replacement/modification determined.
2. Assess and process	2.1. Material requirements are assessed in accordance

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ELEMENT	PERFORMANCE CRITERIA
material requirements	with relevant codes, manufacturers' specifications and standard operating procedures. 2.2. Materials are obtained/requisitioned according to standard operating procedures. 2.3. Tool and equipment requirements are assessed and obtained, where required, according to standard operating procedures.
3. Prepare materials	3.1. Fabrication for repair/replacement and/or modification is prepared to specification using acceptable workplace practices, tools and equipment. 3.2. Materials are marked out and prepared to specifications with minimum wastage using correct principles, tools, equipment and procedures. 3.3. Materials are cut, bent, rolled, shaped or formed to specifications using appropriate fabrication techniques/procedures, tools and equipment. 3.4. Where required, items are marked for identification.
4. Repair, replace or modify fabrication	4.1. Using suitable clamping methods, equipment, jigs and fixtures, materials are positioned/clamped for welding. 4.2. Pre-tack checks are undertaken and compliance with specifications is determined prior to tack welding in position. 4.3. Welding equipment is prepared and settings are adjusted according to requirements. 4.4. Immediate work site environment is checked to ensure compliance with safety requirements and procedures. 4.5. Material or item is tack welded using appropriate distortion minimisation techniques and procedures. 4.6. Material or item is checked against specifications prior to welding. 4.7. Material or item is welded to specifications using techniques and procedures appropriate to job requirements.
5. Finish and inspect repair, replacements and/or modification	5.1. Repair, replacement and/or modification is cleaned and finished to specifications using appropriate workplace practices. 5.2. Welds are visually inspected to assess weld quality against predetermined specifications. 5.3. Completed repair, replacement and/or modification is assessed against specifications.

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ELEMENT	PERFORMANCE CRITERIA
	5.4. Maintenance report is prepared and lodged according to standard operating procedures.

Required Skills and Knowledge

REQUIRED SKILLS AND KNOWLEDGE
This section describes the skills and knowledge required for this unit.
Required skills
Look for evidence that confirms skills in: • visually inspecting fabrication for defects, faults, and compliance • marking out • minimising wastage of materials • cutting, bending, rolling, shaping or forming materials • positioning and clamping materials for welding • undertaking pre-welding/tacking checks • setting up and adjusting welding equipment • tack welding • welding according to all relevant codes, and specifications • cleaning and finishing materials/fabrication • reading and interpreting job sheets, specifications, drawings, standard operating procedures, manufacturer documentation and other literature to the level required by this unit • assessing material and equipment requirements • using measuring skills for preparing and marking out materials and for checking modification against specifications • completing short reports using relevant terminology and format
Required knowledge
Look for evidence that confirms knowledge of: • applicable industry standards, national/Australian standards, NOHSC guidelines, State/Territory regulatory codes of practice/standards • characteristics of faults, defects and or non-compliance • means of rectifying faults, defects and/or non-compliance by rework or additional work, or by replacement of components/materials • effects of proposed modifications on the fabrication • reasons for selection of specific materials, tools, equipment and consumables

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REQUIRED SKILLS AND KNOWLEDGE
• marking out principles, techniques • material preparation processes • clamping method(s) for the welds undertaken. • location of all materials to be welded • weld specifications • equipment, consumables and settings required to achieve the weld specification • distortion minimisation procedures and methods for rectifying any distortion of materials • material cleaning and finishing processes for the repair/replacement/modification • reporting requirements • use and application of personal protective equipment • safe work practices and procedures • hazards and hazard control measures associated with repairing, replacing or modifying fabrications

Evidence Guide

EVIDENCE GUIDE	
The evidence guide provides advice on assessment and must be read in conjunction with the performance criteria, required skills and knowledge, range statement and the Assessment Guidelines for the Training Package.	
Overview of assessment	A person who demonstrates competency in this unit must be able to integrate skills in fabrication maintenance and repair/replace/modify fabrications. Competency in this unit cannot be claimed until all prerequisites have been satisfied.
Critical aspects for assessment and evidence required to demonstrate competency in this unit	Assessors must be satisfied that the candidate can competently and consistently perform all elements of the unit as specified by the criteria, including required knowledge, and be capable of applying the competency in new and different situations and contexts.
Context of and specific resources for assessment	This unit may be assessed on the job, off the job or a combination of both on and off the job. Where assessment occurs off the job, that is the candidate is not in productive work, then an appropriate simulation must be used where the range of conditions reflects realistic workplace situations. The competencies covered by this

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EVIDENCE GUIDE	
	unit would be demonstrated by an individual working alone or as part of a team. The assessment environment should not disadvantage the candidate. This unit could be assessed in conjunction with any other units addressing the safety, quality, communication, materials handling, recording and reporting associated with repairing, replacing or modifying fabrications, or other units requiring the exercise of the skills and knowledge covered by this unit.
Method of assessment	Assessors should gather a range of evidence that is valid, sufficient, current and authentic. Evidence can be gathered through a variety of ways including direct observation, supervisor's reports, project work, samples and questioning. Questioning techniques should not require language, literacy and numeracy skills beyond those required in this unit of competency. The candidate must have access to all tools, equipment, materials and documentation required. The candidate must be permitted to refer to any relevant workplace procedures, product and manufacturing specifications, codes, standards, manuals and reference materials.
Guidance information for assessment	

Range Statement

RANGE STATEMENT	
The range statement relates to the unit of competency as a whole. It allows for different work environments and situations that may affect performance. Bold italicised wording, if used in the performance criteria, is detailed below. Essential operating conditions that may be present with training and assessment (depending on the work situation, needs of the candidate, accessibility of the item, and local industry and regional contexts) may also be included.	
Fabrication inspected	Determine defects/faults, non-compliance with specifications, repair/replacement/modification
Marked out	Marking out principles, techniques

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RANGE STATEMENT	
Marked for identification	To undergo repair, replacement and/or modification, to be cut, bent, rolled, shaped or formed to specifications
Clamping methods	Automatic, semi-automatic, manual methods
Welding equipment	MMAW, GMAW, GTAW

Unit Sector(s)

Unit sector	

Co-requisite units

Co-requisite units		

Competency field

Competency field	Fabrication

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MEM05043B Perform welds to code standards using gas metal arc welding process

Modification History

Release 4 - equivalent. Australian Standard code corrected to AS4041.

Unit Descriptor

Unit descriptor	This unit covers preparing and producing welds to code standards using gas metal arc welding (GMAW).

Application of the Unit

Application of the unit	This unit applies to performing GMAW to code standard carried out using a range of materials. Welds in this unit are associated with high quality fabrications. Butt and fillet welds in the flat, horizontal, vertical and overhead positions would be applied to meet Australian Standards 1210, AS 4041, ASME IX or equivalent. This unit, in conjunction with Unit MEM05026C (Apply welding principles), may satisfy the requirements of AS 1796 Certificate 8G. **Band**: This unit has dual status and is to be regarded as both a Specialisation Band A unit and Specialisation Band B unit for progression to C7 (AQF level IV). **Unit Weight**: **6**

Licensing/Regulatory Information

Not Applicable

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Pre-Requisites

Prerequisite units		
Path 1	MEM05007C	Perform manual heating and thermal cutting
	MEM05017D	Weld using gas metal arc welding process
	MEM05018C	Perform advanced welding using gas metal arc welding process
	MEM05026C	Apply welding principles
	MEM05050B	Perform routine gas metal arc welding
	MEM05051A	Select welding processes
	MEM05052A	Apply safe welding practices
	MEM09002B	Interpret technical drawing
	MEM12023A	Perform engineering measurements
	MEM18001C	Use hand tools
	MEM18002B	Use power tools/hand held operations

Employability Skills Information

Employability skills	This unit contains employability skills.

Elements and Performance Criteria Pre-Content

Elements describe the essential outcomes of a unit of competency.	Performance criteria describe the performance needed to demonstrate achievement of the element. Where bold italicised text is used, further information is detailed in the required skills and knowledge section and the range

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	statement. Assessment of performance is to be consistent with the evidence guide.

Elements and Performance Criteria

ELEMENT	PERFORMANCE CRITERIA
1. Maintain welding equipment	1.1. Routine maintenance is performed on welding equipment.
2. Prepare welding materials and equipment for GMAW welding to code standard	2.1. Weld requirements for GMAW welding to code standards are determined. 2.2. Materials are prepared to produce weld to code standard. 2.3. Welding equipment is set up correctly.
3. Weld joints using GMAW to procedure specifications	3.1. Materials are welded as per weld procedure specification.
4. Ensure weld quality	4.1. Discontinuities are rectified to ensure conformance to code requirements. 4.2. Weld records are maintained in accordance with standard operating procedures.

Required Skills and Knowledge

REQUIRED SKILLS AND KNOWLEDGE
This section describes the skills and knowledge required for this unit.
Required skills
Look for evidence that confirms skills in: • depositing welds to procedure requirements • determining weld outcomes, consumables and settings from welding procedure specification • interpreting technical drawings and weld specifications for welding to code standards using GMAW • using hand and power tools to prepare and weld materials to code standard • using measurement and numeracy skills for welding to code standards • using language and literacy skills to enable completion of weld records

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REQUIRED SKILLS AND KNOWLEDGE
Required knowledge
Look for evidence that confirms knowledge of: • requirements to produce welds to quality of AS 1210, AS 4041, ASME IX or equivalent • safe welding practices • use and application of personal protective equipment for GMAW • relevant standards or codes • methods for preparing plate and pipe for code standard welding • pre-welding and post-welding heating methods and requirements for plate and pipe welding to code standard • requirements for maintaining weld records to code standard • hazard and control measures associated with welding, including housekeeping

Evidence Guide

EVIDENCE GUIDE	
The evidence guide provides advice on assessment and must be read in conjunction with the performance criteria, required skills and knowledge, range statement and the Assessment Guidelines for the Training Package.	
Overview of assessment	A person who demonstrates competency in this unit must be able to prepare and produce welds to code standards using GMAW process. Competency in this unit cannot be claimed until all prerequisites have been satisfied.
Critical aspects for assessment and evidence required to demonstrate competency in this unit	Assessors must be satisfied that the candidate can competently and consistently perform all elements of the unit as specified by the criteria, including required knowledge, and be capable of applying the competency in new and different situations and contexts.
Context of and specific resources for assessment	This unit may be assessed on the job, off the job or a combination of both on and off the job. Where assessment occurs off the job, that is the candidate is not in productive work, then an appropriate simulation must be used where the range of conditions reflects realistic workplace situations. The competencies covered by this unit would be demonstrated by an individual working alone or as part of a team. The assessment environment

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EVIDENCE GUIDE	
	should not disadvantage the candidate. This unit could be assessed in conjunction with any other units addressing the safety, quality, communication, materials handling, recording and reporting associated with performing welds to code standards using gas metal arc welding process or other units requiring the exercise of the skills and knowledge covered by this unit.
Method of assessment	Assessors should gather a range of evidence that is valid, sufficient, current and authentic. Evidence can be gathered through a variety of ways including direct observation, supervisor's reports, project work, samples and questioning. Questioning techniques should not require language, literacy and numeracy skills beyond those required in this unit of competency. The candidate must have access to all tools, equipment, materials and documentation required. The candidate must be permitted to refer to any relevant workplace procedures, product and manufacturing specifications, codes, standards, manuals and reference materials.
Guidance information for assessment	

Range Statement

RANGE STATEMENT	
The range statement relates to the unit of competency as a whole. It allows for different work environments and situations that may affect performance. Bold italicised wording, if used in the performance criteria, is detailed below. Essential operating conditions that may be present with training and assessment (depending on the work situation, needs of the candidate, accessibility of the item, and local industry and regional contexts) may also be included.	
Routine maintenance	Ensuring gun, liner, contact tip etc. are in serviceable condition
Prepared	Flame cut and ground or machined; preheating, setting up of jigs, fixtures, clamps, etc.
Materials	Carbon/manganese steel, low alloy steel and

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RANGE STATEMENT	
	aluminium materials, etc. on plate, pipe and rolled steel sections

Unit Sector(s)

Unit sector	

Co-requisite units

Co-requisite units		

Competency field

Competency field	Fabrication

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MEM05044B Perform welds to code standards using gas tungsten arc welding process

Modification History

Release 3 - equivalent. Australian Standard code corrected to AS4041.

Unit Descriptor

Unit descriptor	This unit covers preparing and producing welds to code standards using gas tungsten arc welding (GTAW).

Application of the Unit

Application of the unit	This unit applies to welds associated with high quality fabrications, using a range of materials. Butt and fillet welds in the flat, horizontal, vertical and overhead positions would be applied to meet Australian Standards 1210, AS 4041, ASME IX or equivalent. The unit, together with Unit MEM05026C (Apply welding principles), may satisfy the requirements of AS 1796 Certificate 7. Where advanced manual thermal cutting, gouging and shaping is carried out, Unit MEM05008C (Perform advanced manual thermal cutting, gouging and shaping) should also be selected. **Band**: This unit has dual status and is to be regarded as both a Specialisation band A unit and Specialisation band B unit for progression to C7 (AQF level IV). **Unit Weight**: **6**

Licensing/Regulatory Information

Not Applicable

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Pre-Requisites

Prerequisite units		
Path 1	MEM05007C	Perform manual heating and thermal cutting
	MEM05019D	Weld using gas tungsten arc welding process
	MEM05020C	Perform advanced welding using gas tungsten arc welding process
	MEM05026C	Apply welding principles
	MEM05049B	Perform routine gas tungsten arc welding
	MEM05051A	Select welding processes
	MEM05052A	Apply safe welding practices
	MEM09002B	Interpret technical drawing
	MEM12023A	Perform engineering measurements
	MEM18001C	Use hand tools
	MEM18002B	Use power tools/hand held operations

Employability Skills Information

Employability skills	This unit contains employability skills.

Elements and Performance Criteria Pre-Content

Elements describe the essential outcomes of a unit of competency.	Performance criteria describe the performance needed to demonstrate achievement of the element. Where bold italicised text is used, further information is detailed in the required skills and knowledge section and the range

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	statement. Assessment of performance is to be consistent with the evidence guide.

Elements and Performance Criteria

ELEMENT	PERFORMANCE CRITERIA
1. Maintain welding equipment	1.1. Routine maintenance is performed on welding equipment.
2. Prepare welding materials and equipment for GTAW welding to code standard	2.1. Weld requirements for GTAW welding to code standards are determined. 2.2. Materials are prepared to produce weld to code standard. 2.3. Welding equipment is set up correctly.
3. Weld joints using GTAW to procedure specifications	3.1. Materials are welded as per weld procedure specification.
4. Ensure weld quality	4.1. Discontinuities are rectified to ensure conformance to code requirements. 4.2. Weld records are maintained in accordance with standard operating procedures.

Required Skills and Knowledge

REQUIRED SKILLS AND KNOWLEDGE
This section describes the skills and knowledge required for this unit.
Required skills
Look for evidence that confirms skills in: • depositing welds to procedure requirements • determining weld outcomes, consumables and settings from welding procedure specification • interpreting technical drawings and weld specifications for welding to code standards using GTAW • using hand and power tools to prepare and weld materials to code standard • using measurement and numeracy skills for welding to code standards • reading and interpreting routine information on written job instructions,

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REQUIRED SKILLS AND KNOWLEDGE
specifications and standard operating procedures. May include drawings • following oral instructions
Required knowledge
Look for evidence that confirms knowledge of: • requirements to produce welds to quality of AS 1210, AS 4041, ASME IX or equivalent • safe welding practices • use and application of personal protective equipment for GTAW • relevant standards or codes • methods for preparing plate and pipe for code standard welding • pre-welding and post-welding heating methods and requirements for plate and pipe welding to code standard • requirements for maintaining weld records to code standard • hazards and control measures associated with welding, including housekeeping

Evidence Guide

EVIDENCE GUIDE	
The evidence guide provides advice on assessment and must be read in conjunction with the performance criteria, required skills and knowledge, range statement and the Assessment Guidelines for the Training Package.	
Overview of assessment	A person who demonstrates competency in this unit must be able to prepare and produce welds to code standards using GTAW process. Competency in this unit cannot be claimed until all prerequisites have been satisfied.
Critical aspects for assessment and evidence required to demonstrate competency in this unit	Assessors must be satisfied that the candidate can competently and consistently perform all elements of the unit as specified by the criteria, including required knowledge, and be capable of applying the competency in new and different situations and contexts.
Context of and specific resources for assessment	This unit may be assessed on the job, off the job or a combination of both on and off the job. Where assessment occurs off the job, that is the candidate is not in productive work, then an appropriate simulation must be used where the range of conditions reflects realistic

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EVIDENCE GUIDE	
	workplace situations. The competencies covered by this unit would be demonstrated by an individual working alone or as part of a team. The assessment environment should not disadvantage the candidate. This unit could be assessed in conjunction with any other units addressing the safety, quality, communication, materials handling, recording and reporting associated with performing welds to code standards using gas tungsten arc welding process (GTAW) or other units requiring the exercise of the skills and knowledge covered by this unit.
Method of assessment	Assessors should gather a range of evidence that is valid, sufficient, current and authentic. Evidence can be gathered through a variety of ways including direct observation, supervisor's reports, project work, samples and questioning. Questioning techniques should not require language, literacy and numeracy skills beyond those required in this unit of competency. The candidate must have access to all tools, equipment, materials and documentation required. The candidate must be permitted to refer to any relevant workplace procedures, product and manufacturing specifications, codes, standards, manuals and reference materials.
Guidance information for assessment	

Range Statement

RANGE STATEMENT	
The range statement relates to the unit of competency as a whole. It allows for different work environments and situations that may affect performance. Bold italicised wording, if used in the performance criteria, is detailed below. Essential operating conditions that may be present with training and assessment (depending on the work situation, needs of the candidate, accessibility of the item, and local industry and regional contexts) may also be included.	
Routine maintenance	Ensuring hand piece, gas shroud, flow meter etc. are in serviceable condition

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RANGE STATEMENT	
Prepared	Flame cut and ground or machined, preheating, setting up of jigs, fixtures, clamps, etc.
Materials	Carbon/manganese steel, low alloy steel and aluminium materials, etc. on plate, pipe and rolled steel sections

Unit Sector(s)

Unit sector	

Co-requisite units

Co-requisite units		

Competency field

Competency field	

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MEM05045B Perform pipe welds to code standards using manual metal arc welding process

Modification History

Release 3 - equivalent. Australian Standard code corrected to AS4041.

Unit Descriptor

Unit descriptor	This unit covers preparing and producing pipe welds to code standards using manual metal arc welding (MMAW).

Application of the Unit

Application of the unit	This unit applies to MMAW to code standard carried out using a range of materials. Welds in this unit are associated with high quality fabrications. Butt welds in pipe with the axis horizontal, vertical and/or askew would be applied to meet Australian Standards 1210, AS 4041, ASME IX or equivalent. The unit, together with Unit MEM05026C (Apply welding principles), may satisfy the requirements of AS 1796 Certificates 2 and 4. Where advanced manual thermal cutting, gouging and shaping is carried out, Unit MEM05008C (Perform advanced manual thermal cutting, gouging and shaping) should also be selected. **Band**: This unit has dual status and is to be regarded as both a Specialisation band A unit and Specialisation band B unit for progression to C7 (AQF level IV). **Unit Weight**: **6**

Licensing/Regulatory Information

Not Applicable

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Pre-Requisites

Prerequisite units		
Path 1	MEM05007C	Perform manual heating and thermal cutting
	MEM05012C	Perform routine manual metal arc welding
	MEM05015D	Weld using manual metal arc welding process
	MEM05016C	Perform advanced welding using manual metal arc welding process
	MEM05026C	Apply welding principles
	MEM05051A	Select welding processes
	MEM05052A	Apply safe welding practices
	MEM09002B	Interpret technical drawing
	MEM12023A	Perform engineering measurements
	MEM18001C	Use hand tools
	MEM18002B	Use power tools/hand held operations

Employability Skills Information

Employability skills	This unit contains employability skills.

Elements and Performance Criteria Pre-Content

Elements describe the essential outcomes of a unit of competency.	Performance criteria describe the performance needed to demonstrate achievement of the element. Where bold italicised text is used, further information is detailed in the required skills and knowledge section and the range

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	statement. Assessment of performance is to be consistent with the evidence guide.

Elements and Performance Criteria

ELEMENT	PERFORMANCE CRITERIA
1. Maintain welding equipment	1.1. Routine maintenance is performed on welding equipment.
2. Prepare welding materials and equipment for MMAW pipe welding to code standards	2.1. Weld requirements for MMAW welding to code standards are determined. 2.2. Welding equipment is set up correctly. 2.3. Materials are prepared to produce pipe weld to code standard.
3. Weld pipe using MMAW to procedure specifications	3.1. Materials are welded as per weld procedure specification.
4. Ensure weld quality	4.1. Discontinuities are rectified to ensure conformance to code requirements. 4.2. Weld records are maintained in accordance with standard operating procedures.

Required Skills and Knowledge

REQUIRED SKILLS AND KNOWLEDGE
This section describes the skills and knowledge required for this unit.
Required skills
Look for evidence that confirms skills in: • depositing welds to procedure requirements. • determining weld outcomes, consumables and settings from welding procedure specification • interpreting technical drawings and weld specifications for welding to code standards using MMAW • using hand and power tools to prepare and weld materials to code standard • using measurement and numeracy skills for welding to code standards

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REQUIRED SKILLS AND KNOWLEDGE
• using language and literacy skills to enable completion of weld records
Required knowledge
Look for evidence that confirms knowledge of: • requirements to produce welds to quality of AS 1210, AS 4041, ASME IX or equivalent • safe welding practices • use and application of personal protective equipment for MMAW • knowledge of appropriate standards or codes • methods for preparing pipe for code standard welding • pre-welding and post-welding heating methods and requirements for pipe welding to code standard • requirements for maintaining weld records to code standard • hazards and control measures associated with welding, including housekeeping

Evidence Guide

EVIDENCE GUIDE	
The evidence guide provides advice on assessment and must be read in conjunction with the performance criteria, required skills and knowledge, range statement and the Assessment Guidelines for the Training Package.	
Overview of assessment	A person who demonstrates competency in this unit must be able to perform pipe welds to code standards using MMAW process. Competency in this unit cannot be claimed until all prerequisites have been satisfied.
Critical aspects for assessment and evidence required to demonstrate competency in this unit	Assessors must be satisfied that the candidate can competently and consistently perform all elements of the unit as specified by the criteria, including required knowledge, and be capable of applying the competency in new and different situations and contexts.
Context of and specific resources for assessment	This unit may be assessed on the job, off the job or a combination of both. Where assessment occurs off the job, i.e. the candidate is not in productive work, appropriate simulation must be used where the range of conditions reflects realistic workplace situations. The competencies covered by this unit would be

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EVIDENCE GUIDE	
	demonstrated by an individual working alone or as part of a team. The assessment environment should not disadvantage the candidate. This unit could be assessed in conjunction with any other units addressing the safety, quality, communication, materials handling, recording and reporting associated with the preparation and production of welds or other units requiring the exercise of the skills and knowledge covered by this unit.
Method of assessment	Assessors should gather a range of evidence that is valid, sufficient, current and authentic. Evidence can be gathered through a variety of ways including direct observation, supervisor's reports, project work, samples and questioning. Questioning techniques should not require language, literacy and numeracy skills beyond those required in this unit of competency. The candidate must have access to all tools, equipment, materials and documentation required. The candidate must be permitted to refer to any relevant workplace procedures, product and manufacturing specifications, codes, standards, manuals and reference materials.
Guidance information for assessment	

Range Statement

RANGE STATEMENT	
The range statement relates to the unit of competency as a whole. It allows for different work environments and situations that may affect performance. Bold italicised wording, if used in the performance criteria, is detailed below. Essential operating conditions that may be present with training and assessment (depending on the work situation, needs of the candidate, accessibility of the item, and local industry and regional contexts) may also be included.	
Routine maintenance	Ensuring leads, hand pieces etc. are in serviceable condition, and correct current carrying capacity
Prepare welding materials	Preheating, setting up of jigs, fixtures, clamps, etc.

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RANGE STATEMENT	
Prepared	Flame cut and ground or machined
Materials	Carbon/manganese steel, stainless steel and low alloy steel materials, etc.

Unit Sector(s)

Unit sector	

Co-requisite units

Co-requisite units		

Competency field

Competency field	Fabrication

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MEM05046B Perform welds to code standards using manual metal arc welding process

Modification History

Release 3 - equivalent. Australian Standard code corrected to AS4041.

Unit Descriptor

Unit descriptor	This unit covers preparing and producing welds to code standards using manual metal arc welding (MMAW).

Application of the Unit

Application of the unit	This unit applies to MMAW to code standard carried out using a range of materials. Welds in this unit are associated with high quality fabrications. Butt and fillet welds in the flat, horizontal, vertical and overhead positions would be applied to meet Australian Standards 1210, AS 4041, ASME IX or equivalent. This unit, together with Unit MEM05026C (Apply welding principles), may satisfy the requirements of AS 1796 Certificates 1, 1E, 3 and 3E. Where advanced manual thermal cutting, gouging and shaping is carried out, Unit MEM05008C (Perform advanced manual thermal cutting, gouging and shaping) should also be selected. **Band**: This unit has dual status and is to be regarded as both a Specialisation band A unit and Specialisation band B unit for progression to C7 (AQF level IV). **Unit Weight**: **6**

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Licensing/Regulatory Information

Not Applicable

Pre-Requisites

Prerequisite units		
Path 1	MEM05007C	Perform manual heating and thermal cutting
	MEM05012C	Perform routine manual metal arc welding
	MEM05015D	Weld using manual metal arc welding process
	MEM05016C	Perform advanced welding using manual metal arc welding process
	MEM05026C	Apply welding principles
	MEM05051A	Select welding processes
	MEM05052A	Apply safe welding practices
	MEM09002B	Interpret technical drawing
	MEM12023A	Perform engineering measurements
	MEM18001C	Use hand tools
	MEM18002B	Use power tools/hand held operations

Employability Skills Information

Employability skills	This unit contains employability skills.

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Elements and Performance Criteria Pre-Content

Elements describe the essential outcomes of a unit of competency.	Performance criteria describe the performance needed to demonstrate achievement of the element. Where bold italicised text is used, further information is detailed in the required skills and knowledge section and the range statement. Assessment of performance is to be consistent with the evidence guide.

Elements and Performance Criteria

ELEMENT	PERFORMANCE CRITERIA
1. Maintain welding equipment	1.1. Routine maintenance is performed on welding equipment.
2. Prepare welding materials and equipment for MMAW welding to code standard	2.1. Weld requirements for MMAW welding to code standards are determined. 2.2. Materials are prepared to produce weld to code standard. 2.3. Welding equipment is set up correctly.
3. Weld joints using MMAW to procedure specifications	3.1. Materials are welded as per weld procedure specification.
4. Ensure weld quality	4.1. Discontinuities are rectified to ensure conformance to code requirements. 4.2. Weld records are maintained in accordance with standard operating procedures.

Required Skills and Knowledge

REQUIRED SKILLS AND KNOWLEDGE
This section describes the skills and knowledge required for this unit.
Required skills
Look for evidence that confirms skills in: • depositing welds to procedure requirements • determining weld outcomes, consumables and settings from welding procedure

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REQUIRED SKILLS AND KNOWLEDGE
specification • interpreting technical drawings and weld specifications for welding to code standards using MMAW • using hand and power tools to prepare and weld materials to code standard • using measurement and numeracy skills for welding to code standards • using language and literacy skills to enable completion of weld records
Required knowledge
Look for evidence that confirms knowledge of: • requirements to produce welds to quality of AS 1210, AS 4041, ASME IX or equivalent • safe welding practices • use and application of personal protective equipment for MMAW • knowledge of appropriate standards or codes • methods for preparing plate for code standard welding • pre-welding and post-welding heating methods and requirements for plate welding to code standard • requirements for maintaining weld records to code standard • hazards and control measures associated with welding, including housekeeping

Evidence Guide

EVIDENCE GUIDE	
The evidence guide provides advice on assessment and must be read in conjunction with the performance criteria, required skills and knowledge, range statement and the Assessment Guidelines for the Training Package.	
Overview of assessment	A person who demonstrates competency in this unit must be able to perform welds to code standards using MMAW process. Competency in this unit cannot be claimed until all prerequisites have been satisfied.
Critical aspects for assessment and evidence required to demonstrate competency in this unit	Assessors must be satisfied that the candidate can competently and consistently perform all elements of the unit as specified by the criteria, including required knowledge, and be capable of applying the competency in new and different situations and contexts.
Context of and specific resources for	This unit may be assessed on the job, off the job or a

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EVIDENCE GUIDE	
assessment	combination of both on and off the job. Where assessment occurs off the job, that is the candidate is not in productive work, then an appropriate simulation must be used where the range of conditions reflects realistic workplace situations. The competencies covered by this unit would be demonstrated by an individual working alone or as part of a team. The assessment environment should not disadvantage the candidate. This unit could be assessed in conjunction with any other units addressing the safety, quality, communication, materials handling, recording and reporting associated with the preparation and production of welds or other units requiring the exercise of the skills and knowledge covered by this unit.
Method of assessment	Assessors should gather a range of evidence that is valid, sufficient, current and authentic. Evidence can be gathered through a variety of ways including direct observation, supervisor's reports, project work, samples and questioning. Questioning techniques should not require language, literacy and numeracy skills beyond those required in this unit of competency. The candidate must have access to all tools, equipment, materials and documentation required. The candidate must be permitted to refer to any relevant workplace procedures, product and manufacturing specifications, codes, standards, manuals and reference materials.
Guidance information for assessment	

Range Statement

RANGE STATEMENT
The range statement relates to the unit of competency as a whole. It allows for different work environments and situations that may affect performance. Bold italicised wording, if used in the performance criteria, is detailed below. Essential operating conditions that may be present with training and assessment (depending on the work situation, needs of the candidate, accessibility of the item, and local industry and regional contexts) may also be included.

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RANGE STATEMENT	
Routine maintenance	Ensuring leads, hand pieces etc. are in serviceable condition, and correct current carrying capacity
Prepare welding materials	Preheating, setting up of jigs, fixtures, clamps, etc.
Prepared	Flame cut and ground or machined
Materials	Carbon/manganese steel, stainless steel and low alloy steel materials, etc.

Unit Sector(s)

Unit sector	

Co-requisite units

Co-requisite units		

Competency field

Competency field	Fabrication

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MEM05049B Perform routine gas tungsten arc welding

Modification History

Not Applicable

Unit Descriptor

Unit descriptor	This unit covers preparing the materials and carrying out routine gas tungsten arc welding (GTAW).

Application of the Unit

Application of the unit	This unit applies in a maintenance or manufacturing environment where the weld quality is not required to meet an Australian Standard. Fillet and butt welds would typically be performed on low carbon/mild steels and aluminium. Where welding is required to meet Australian Standard 1554 General Purpose or equivalent codes, occupational health and safety regulations and/or licensing requirements, Unit MEM05019D (Weld using gas tungsten arc welding process) should be selected. **Band**: **A** **Unit Weight**: **2**

Licensing/Regulatory Information

Refer to Application of the Unit

Pre-Requisites

Prerequisite units		

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Prerequisite units		

Employability Skills Information

Employability skills	This unit contains employability skills.

Elements and Performance Criteria Pre-Content

Elements describe the essential outcomes of a unit of competency.	Performance criteria describe the performance needed to demonstrate achievement of the element. Where bold italicised text is used, further information is detailed in the required skills and knowledge section and the range statement. Assessment of performance is to be consistent with the evidence guide.

Elements and Performance Criteria

ELEMENT	**PERFORMANCE CRITERIA**
1. Identify weld requirements	1.1. Weld requirements are identified from job instructions. 1.2. The locations of welds are identified in accordance with standard operating procedures and job specifications.
2. Prepare materials for welding	2.1. Materials are cleaned and prepared ready for welding.
3. Prepare equipment for welding	3.1. Welding equipment is set up correctly. 3.2. Settings and consumables are selected to suit application.
4. Perform routine welding using GTAW	4.1. Safe welding practices are applied. 4.2. Materials are welded to job requirements. 4.3. Welds are cleaned to standard operating procedures.

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Required Skills and Knowledge

REQUIRED SKILLS AND KNOWLEDGE This section describes the skills and knowledge required for this unit.
Required skills
Look for evidence that confirms skills in: • preparing materials • setting up welding equipment • welding with GTAW • reading and interpreting routine information on written job instructions, specifications and standard operating procedures • using measurement skills for joint preparation and routine GTAW
Required knowledge
Look for evidence that confirms knowledge of: • preparatory requirements • properties and characteristics of materials and consumables • equipment and equipment settings • fuel gas properties and applications • post welding treatments • weld characteristics • safe welding practices • use and application of personal protective equipment for routine GTAW

Evidence Guide

EVIDENCE GUIDE	
The evidence guide provides advice on assessment and must be read in conjunction with the performance criteria, required skills and knowledge, range statement and the Assessment Guidelines for the Training Package.	
Overview of assessment	A person who demonstrates competency in this unit must be able to perform routine gas tungsten arc welding (GTAW).

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EVIDENCE GUIDE	
Critical aspects for assessment and evidence required to demonstrate competency in this unit	Assessors must be satisfied that the candidate can competently and consistently perform all elements of the unit as specified by the criteria, including required knowledge, and be capable of applying the competency in new and different situations and contexts.
Context of and specific resources for assessment	This unit may be assessed on the job, off the job or a combination of both on and off the job. Where assessment occurs off the job, that is the candidate is not in productive work, then an appropriate simulation must be used where the range of conditions reflects realistic workplace situations. The competencies covered by this unit would be demonstrated by an individual working alone or as part of a team. The assessment environment should not disadvantage the candidate. This unit could be assessed in conjunction with any other units addressing the safety, quality, communication, materials handling, recording and reporting associated with carrying out routine gas tungsten arc welding or other units requiring the exercise of the skills and knowledge covered by this unit.
Method of assessment	Assessors should gather a range of evidence that is valid, sufficient, current and authentic. Evidence can be gathered through a variety of ways including direct observation, supervisor's reports, project work, samples and questioning. Questioning techniques should not require language, literacy and numeracy skills beyond those required in this unit of competency. The candidate must have access to all tools, equipment, materials and documentation required. The candidate must be permitted to refer to any relevant workplace procedures, product and manufacturing specifications, codes, standards, manuals and reference materials.
Guidance information for assessment	

Range Statement

RANGE STATEMENT

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RANGE STATEMENT	
The range statement relates to the unit of competency as a whole. It allows for different work environments and situations that may affect performance. Bold italicised wording, if used in the performance criteria, is detailed below. Essential operating conditions that may be present with training and assessment (depending on the work situation, needs of the candidate, accessibility of the item, and local industry and regional contexts) may also be included.	
Materials	Mild and low carbon steel
Prepared	Preheating, setting up jigs, fixtures, clamps, joint preparation
Equipment	Hoses, welding leads and gas shrouds, electrodes, gas regulator, liners, contact tips
Consumables	Tungsten electrodes, filler wire, shielding gas
Cleaned	Slag, spatter

Unit Sector(s)

Unit sector	

Co-requisite units

Co-requisite units		

Competency field

Competency field	Fabrication

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MEM05050B Perform routine gas metal arc welding

Modification History

Not Applicable

Unit Descriptor

Unit descriptor	This unit covers preparing materials and routine gas metal arc welding (GMAW).

Application of the Unit

Application of the unit	This unit applies in a maintenance or manufacturing environment where the weld quality is not required to meet an Australian Standard or equivalent. Fillet and butt welds would typically be performed on low carbon/mild steels. Where welding is required to meet Australian Standard 1554 General Purpose or equivalent codes, occupational health and safety regulations and/or licensing requirements, Unit MEM05017D (Weld using gas metal arc welding process) should be selected. **Band**: **A** **Unit Weight**: **2**

Licensing/Regulatory Information

Refer to Application of the Unit

Pre-Requisites

Prerequisite units		

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Prerequisite units		

Employability Skills Information

Employability skills	This unit contains employability skills.

Elements and Performance Criteria Pre-Content

Elements describe the essential outcomes of a unit of competency.	Performance criteria describe the performance needed to demonstrate achievement of the element. Where bold italicised text is used, further information is detailed in the required skills and knowledge section and the range statement. Assessment of performance is to be consistent with the evidence guide.

Elements and Performance Criteria

ELEMENT	**PERFORMANCE CRITERIA**
1. Identify weld requirements	1.1. Weld requirements are identified from job instructions. 1.2. Locations of welds are identified in according to standard operating procedures and job specifications.
2. Prepare materials for welding	2.1. Materials are cleaned and prepared ready for welding.
3. Prepare equipment for welding	3.1. Welding equipment is set up correctly. 3.2. Settings and consumables are selected to suit application.
4. Perform routine welding using GMAW	4.1. Safe welding practices are applied. 4.2. Materials are welded to job requirements. 4.3. Welds are cleaned to standard operating procedures.

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Required Skills and Knowledge

REQUIRED SKILLS AND KNOWLEDGE This section describes the skills and knowledge required for this unit.
Required skills
Look for evidence that confirms skills in: • preparing materials • setting up welding equipment • welding with GMAW • reading and interpreting routine information on written job instructions, specifications and standard operating procedures • following oral instruction • using measurement skills relating to joint preparation and routine GMAW
Required knowledge
Look for evidence that confirms knowledge of: • different current and voltage settings, gas flow rates wire diameters, wire feed speed and other variables to suit typical situations. • material and equipment preparation • properties and characteristics of materials and consumables • equipment and equipment settings • fuel gas properties and applications • post-welding treatments • weld characteristics • safe welding practices • use and application of personal protective equipment for routine GMAW

Evidence Guide

EVIDENCE GUIDE	
The evidence guide provides advice on assessment and must be read in conjunction with the performance criteria, required skills and knowledge, range statement and the Assessment Guidelines for the Training Package.	
Overview of assessment	A person who demonstrates competency in this unit must

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EVIDENCE GUIDE	
	be able to perform routine gas metal arc welding (GMAW).
Critical aspects for assessment and evidence required to demonstrate competency in this unit	Assessors must be satisfied that the candidate can competently and consistently perform all elements of the unit as specified by the criteria, including required knowledge, and be capable of applying the competency in new and different situations and contexts.
Context of and specific resources for assessment	This unit may be assessed on the job, off the job or a combination of both on and off the job. Where assessment occurs off the job, that is the candidate is not in productive work, then an appropriate simulation must be used where the range of conditions reflects realistic workplace situations. The competencies covered by this unit would be demonstrated by an individual working alone or as part of a team. The assessment environment should not disadvantage the candidate. This unit could be assessed in conjunction with any other units addressing the safety, quality, communication, materials handling, recording and reporting associated with preparing the materials and carrying out routine gas metal arc welding or other units requiring the exercise of the skills and knowledge covered by this unit.
Method of assessment	Assessors should gather a range of evidence that is valid, sufficient, current and authentic. Evidence can be gathered through a variety of ways including direct observation, supervisor's reports, project work, samples and questioning. Questioning techniques should not require language, literacy and numeracy skills beyond those required in this unit of competency. The candidate must have access to all tools, equipment, materials and documentation required. The candidate must be permitted to refer to any relevant workplace procedures, product and manufacturing specifications, codes, standards, manuals and reference materials.
Guidance information for assessment	

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Range Statement

RANGE STATEMENT	
The range statement relates to the unit of competency as a whole. It allows for different work environments and situations that may affect performance. Bold italicised wording, if used in the performance criteria, is detailed below. Essential operating conditions that may be present with training and assessment (depending on the work situation, needs of the candidate, accessibility of the item, and local industry and regional contexts) may also be included.	
Materials	Mild and low carbon steel
Prepared	Preheating, setting up jigs, fixtures, clamps, joint preparation
Equipment	Hoses, welding leads, gas shrouds, gas regulators, liners, contact tips
Consumables	Filler wire, shielding gas
Cleaned	Slag and spatter

Unit Sector(s)

Unit sector	

Co-requisite units

Co-requisite units		

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Competency field

Competency field	Fabrication

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MEM05051A Select welding processes

Modification History

Not Applicable

Unit Descriptor

Unit descriptor	This unit covers identifying material properties and selecting appropriate welding processes to achieve safe and effective welding outcomes.

Application of the Unit

Application of the unit	This unit applies to all types of welding. It includes the identification of properties and characteristics of all commonly used metals, and selection of appropriate welding techniques to ensure integrity of materials is maintained during welding processes. **Band**: **A** **Unit Weight**: **2**

Licensing/Regulatory Information

Not Applicable

Pre-Requisites

Prerequisite units		

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Employability Skills Information

Employability skills	This unit contains employability skills.

Elements and Performance Criteria Pre-Content

Elements describe the essential outcomes of a unit of competency.	Performance criteria describe the performance needed to demonstrate achievement of the element. Where bold italicised text is used, further information is detailed in the required skills and knowledge section and the range statement. Assessment of performance is to be consistent with the evidence guide.

Elements and Performance Criteria

ELEMENT	PERFORMANCE CRITERIA
1. Identify properties of commonly used metals	1.1. Materials to be welded are identified. 1.2. Characteristics and properties of commonly used materials are identified. 1.3. Uses and purposes of commonly used materials are identified. 1.4. Basic metallurgical characteristics are considered.
2. Identify and provide for welding contingencies	2.1. Information relevant to welding processes is sourced as required. 2.2. Potential contingencies are identified and solutions are considered.
3. Identify appropriate welding processes	3.1. Welding processes are identified and selected to achieve specified outcomes with selected metals. 3.2. Effects of welding processes on materials are identified. 3.3. Distortion prevention measures are identified. 3.4. Alternative joining methods for job are identified and assessed for relevancy.
4. Identify cleaning and preparation requirements	4.1. Processes for cleaning and preparing metals are identified. 4.2. Role of contaminants in welding flaws is explained. 4.3. Safety requirements for chemicals and other

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ELEMENT	PERFORMANCE CRITERIA
	materials are identified and utilised in accordance with manufacturers' specifications and legislative requirements.

Required Skills and Knowledge

REQUIRED SKILLS AND KNOWLEDGE
This section describes the skills and knowledge required for this unit.
Required skills
Look for evidence that confirms skills in: • reading, interpreting and following information on written job instructions, specifications, standard operating procedures, charts, lists, drawings and other applicable reference documents • planning and sequencing operations • checking and clarifying task-related information
Required knowledge
Look for evidence that confirms knowledge of: • hazards and control measures associated with welding practices, including housekeeping • safe work practices and procedures • properties and characteristics of commonly used metals and materials • basic metallurgy principles • information resources • chemical content of fumes emitted by welding processes • uses and purposes of various metals • distortion prevention measures for various metals

Evidence Guide

EVIDENCE GUIDE
The evidence guide provides advice on assessment and must be read in conjunction with the

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EVIDENCE GUIDE	
performance criteria, required skills and knowledge, range statement and the Assessment Guidelines for the Training Package.	
Overview of assessment	A person who demonstrates competency in this unit must be able to select welding processes.
Critical aspects for assessment and evidence required to demonstrate competency in this unit	Assessors must be satisfied that the candidate can competently and consistently perform all elements of the unit as specified by the criteria, including required knowledge, and be capable of applying the competency in new and different situations and contexts.
Context of and specific resources for assessment	This unit may be assessed on the job, off the job or a combination of both on and off the job. Where assessment occurs off the job, that is the candidate is not in productive work, then an appropriate simulation must be used where the range of conditions reflects realistic workplace situations. The competencies covered by this unit would be demonstrated by an individual working alone or as part of a team. The assessment environment should not disadvantage the candidate. This unit could be assessed in conjunction with any other units addressing the safety, quality, communication, materials handling, recording and reporting associated with selecting welding processes or other units requiring the exercise of the skills and knowledge covered by this unit.
Method of assessment	Assessors should gather a range of evidence that is valid, sufficient, current and authentic. Evidence can be gathered through a variety of ways including direct observation, supervisor's reports, project work, samples and questioning. Questioning techniques should not require language, literacy and numeracy skills beyond those required in this unit of competency. The candidate must have access to all tools, equipment, materials and documentation required. The candidate must be permitted to refer to any relevant workplace procedures, product and manufacturing specifications, codes, standards, manuals and reference materials.
Guidance information for assessment	

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Range Statement

RANGE STATEMENT	
The range statement relates to the unit of competency as a whole. It allows for different work environments and situations that may affect performance. Bold italicised wording, if used in the performance criteria, is detailed below. Essential operating conditions that may be present with training and assessment (depending on the work situation, needs of the candidate, accessibility of the item, and local industry and regional contexts) may also be included.	
Characteristics	Tensile strength, grade, heat resistance, density
Properties	Physical properties, flammable limits, melting point
Basic metallurgical characteristics	Alloys and grades of metals and different types of electrodes
Information	Steel suppliers handbooks, welding company materials, standard operating procedures, safety documentation

Welding processes	• Fusion:
	  • electric arc welding
	  • gas (oxy-fuel) welding
	  • thermit welding
	• Pressure welding processes:
	  • resistance welding
	  • fire or forge welding
	  • friction welding
	  • explosive welding
	• Low temperature processes:
	  • soldering
	  • brazing
	• Other:
	  • ultrasonic welding
	  • electron beam welding

Effects	Thermal expansion, heat affected zones, fume emissions, altered density, distortion
Distortion prevention measures	Heat treatments, consolidations
Processes for cleaning and weld preparation	Etching, grinding, arc gouging, thermal cutting, chemical additives, anti-corrosion treatments

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RANGE STATEMENT	
Safety requirements	• Dry and ventilated areas • In accordance with workplace procedures • Location away from heat risks • Location away from incompatible substances • Requirements for hazardous substances • Adequate signage and labelling • Appropriate sealing • Routine inspections • Emergency procedures • Regulatory notification requirements

Unit Sector(s)

Unit sector	

Co-requisite units

Co-requisite units		

Competency field

Competency field	Fabrication

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MEM05052A Apply safe welding practices

Modification History

Not Applicable

Unit Descriptor

Unit descriptor	This unit covers identifying risks associated with welding operations and implementing hazard reduction practices.

Application of the Unit

Application of the unit	This unit applies to gas and electric arc welding. It includes the identification of risks associated with welding all commonly used metals and implementation of techniques used to reduce or eliminate welding hazards. **Band**: **A** **Unit Weight**: **4**

Licensing/Regulatory Information

Not Applicable

Pre-Requisites

Prerequisite units		

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Employability Skills Information

Employability skills	This unit contains employability skills.

Elements and Performance Criteria Pre-Content

Elements describe the essential outcomes of a unit of competency.	Performance criteria describe the performance needed to demonstrate achievement of the element. Where bold italicised text is used, further information is detailed in the required skills and knowledge section and the range statement. Assessment of performance is to be consistent with the evidence guide.

Elements and Performance Criteria

ELEMENT	PERFORMANCE CRITERIA
1. Access and interpret OH&S information	1.1. OH&S information is obtained and interpreted. 1.2. Relevant OH&S legislation is identified. 1.3. Work related safety information is obtained and interpreted.
2. Identify risks associated with welding	2.1. Pollutants formed by welding processes are identified. 2.2. Occupational diseases and injuries which may be associated with welding are identified. 2.3. Factors associated with increased risk are identified. 2.4. Exposure levels for pollutants are identified. 2.5. Risks and potential health effects associated with specific metals are identified. 2.6. Risks and potential health effects associated with gases in welding are identified. 2.7. Other hazards of welding are identified.
3. Reduce risks associated with welding	3.1. Manual handling techniques are used. 3.2. Personal protective equipment is used correctly. 3.3. Procedures to control hazards are implemented. 3.4. Workplace safety procedures are implemented. 3.5. Workplace safety non-compliances are reported in accordance with workplace procedures.

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Required Skills and Knowledge

REQUIRED SKILLS AND KNOWLEDGE This section describes the skills and knowledge required for this unit.
Required skills
Look for evidence that confirms skills in: • sourcing and interpreting safety-related information and Material Safety Data Sheets (MSDS) • planning and sequencing operations • identifying workplace risks and nonconformances • reporting workplace risks and nonconformances • checking and clarifying task-related information
Required knowledge
Look for evidence that confirms knowledge of: • characteristics and properties of common metals and welding materials • effect of gas and electrical welding operations on metals • hazards and control measures associated with gas and electrical welding, including housekeeping • welding safety practices and procedures • effect of various treatments on a range of commonly used metals • use and application of personal protective equipment

Evidence Guide

EVIDENCE GUIDE	
The evidence guide provides advice on assessment and must be read in conjunction with the performance criteria, required skills and knowledge, range statement and the Assessment Guidelines for the Training Package.	
Overview of assessment	A person who demonstrates competency in this unit must be able to apply safe welding practices.
Critical aspects for assessment and	Assessors must be satisfied that the candidate can

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EVIDENCE GUIDE	
evidence required to demonstrate competency in this unit	competently and consistently perform all elements of the unit as specified by the criteria, including required knowledge, and be capable of applying the competency in new and different situations and contexts.
Context of and specific resources for assessment	This unit may be assessed on the job, off the job or a combination of both on and off the job. Where assessment occurs off the job, that is the candidate is not in productive work, then an appropriate simulation must be used where the range of conditions reflects realistic workplace situations. The competencies covered by this unit would be demonstrated by an individual working alone or as part of a team. The assessment environment should not disadvantage the candidate. This unit could be assessed in conjunction with any other units addressing the safety, quality, communication, materials handling, recording and reporting associated with applying safe welding practices or other units requiring the exercise of the skills and knowledge covered by this unit.
Method of assessment	Assessors should gather a range of evidence that is valid, sufficient, current and authentic. Evidence can be gathered through a variety of ways including direct observation, supervisor's reports, project work, samples and questioning. Questioning techniques should not require language, literacy and numeracy skills beyond those required in this unit of competency. The candidate must have access to all tools, equipment, materials and documentation required. The candidate must be permitted to refer to any relevant workplace procedures, product and manufacturing specifications, codes, standards, manuals and reference materials.
Guidance information for assessment	

Range Statement

RANGE STATEMENT
The range statement relates to the unit of competency as a whole. It allows for different

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RANGE STATEMENT	
work environments and situations that may affect performance. Bold italicised wording, if used in the performance criteria, is detailed below. Essential operating conditions that may be present with training and assessment (depending on the work situation, needs of the candidate, accessibility of the item, and local industry and regional contexts) may also be included.	
OH&S information	• National Occupational Health and Safety Commission guidelines • Organisational OH&S practices and procedures manuals • Australian/New Zealand and ISO standards • Company risk management policy • Codes of practice • Australian dangerous goods legislation • Trade practices • Occupational Health and Safety reporting requirements • Weld procedures
Work related safety information	• Standard operating procedures • Material safety data sheets (MSDSs) • Job sheets • Emergency procedures • Safety standards and procedures
Pollutants	• Nitrogen oxides • Ozone • Metal fumes etc. • Lead oxide • Silicon oxide • Calcium fluoride • Calcium oxide • Magnesium oxide • Sodium oxide • Potassium oxides • Carbon dioxide • Organics • Iron • Manganese • Calcium carbonate • Zirconium oxide • Titanium oxide • Hexavalent chromium

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RANGE STATEMENT	
Occupational diseases and injuries	• Eye injuries • Skin damage • Respiratory irritations • Chronic effects • Allergies
Factors	• Gas leakage from cylinders • Type of consumable and metals used • Type of welding processes • Type of electrodes • Welding current • Voltage and amperage • Ventilation • Contamination • Interaction of chemicals • Exposure levels • Flammability
Exposure levels	• Time Weighted Average • Short Term Exposure Limit (STEL) • Maximum Allowable Concentration (MAC) or Threshold Limit Value - Ceiling (TLV-C) • Skin Notation
Specific metals	• Aluminium • Antimony • Arsenic • Beryllium • Boron • Cadmium • Chromium • Copper • Cobalt • Iron • Lead • Lithium • Magnesium • Manganese • Mercury • Molybdenum • Nickel • Platinum • Selenium

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RANGE STATEMENT	
	• Silver • Thorium • Tin • Titanium • Tungsten • Vanadium • Zinc • Zirconium
Gases	• Acetylene • Argon • Carbon dioxide • Carbon monoxide • Helium • Nitrogen oxides • Ozone • Phosgene • Phosphine • Stibine
Other hazards	• Fluxes • Electro-magnetic radiation • Electric shock • Sparks • Spatter • Contaminated and coated metals • Gas cylinder and electrical hazards • Confined spaces • Noise • Chemical exposure • Solvents • Musculoskeletal, back and overuse injuries • Vibration • Dusts • Heat stress • Ultraviolet radiation • Airborne pollutants • Flammable gases • Infrared radiation • Thermal damage
Manual handling techniques	• Housekeeping practices • Lifting weight limits

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RANGE STATEMENT	
	• Appropriate storage • Use of lifting devices • Appropriate training • Hazardous materials storage standards and procedures
Personal protective equipment	• Respirators • Ear muffs • Protective clothing • Gloves • Boots • Helmets • Eye protection • Face shields
Procedures to control hazards	• Substituting hazardous materials with safer materials • Changing workplace design to eliminate hazards • Modifying work practices to reduce exposure • Using personal protective equipment • Using adequate and appropriate ventilation
Workplace safety measures	• Shielding requirements • Ventilation • General and diluted • Local exhaustion • Use of personal protective equipment • Checking equipment condition • Equipment maintenance • Correct operation of equipment • Correct voltage and electrical connections • Good posture • Fire safety, plant and equipment isolation • Communications with appropriate personnel

Unit Sector(s)

Unit sector	

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Co-requisite units

Co-requisite units		

Competency field

Competency field	Fabrication

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MEM07005C Perform general machining

Modification History

Not Applicable

Unit Descriptor

Unit descriptor	This unit of competency covers determining the job requirements and sequence of operations, selecting and mounting tools, performing the machining, measuring the components, and adjusting and maintaining a range of standard machine tools.

Application of the Unit

Application of the unit	The unit of competency applies to the use of machinery to shape metal including lathes, mills, planers, shapers, radial arm drills, slotters and surface grinders. This unit has been developed to support Engineering Tradesperson - Mechanical apprenticeship training and the recognition of trade level skills in machining operations. Skills covered by this unit are generally applied in occupational and work situations associated with fitting and machining. It may also apply to other trade occupations requiring general machining skills. It may also apply in some circumstances to senior operators who have responsibility for machine set up, selection of materials and lubricants, establishment of datum points and basic marking out, and setting of speeds, feeds and other machining parameters. This unit has application in the MEM30205 Certificate III in Engineering - Mechanical qualification and other qualifications requiring a basic trade level of machining skills. It may also apply to MEM20205 Certificate II in Engineering - Production Technology and MEM30105 Certificate III in Engineering - Production Systems and other qualifications requiring machining skills. Machining is undertaken on one or more of a range of standard machine tools. Machines are not computer numerical controlled (CNC) machines.

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	Where machining is undertaken without undertaking any set up including mounting of tools, setting of speeds, feeds and other operational parameters then either MEM07024B Operate and monitor machine/process or MEM07025B Perform advanced machine/process operation should be selected. Drilling operations in this unit exclude those covered by MEM18002B Use power tools/hand held operations. Where substantial marking out is required, MEM12006C Mark off/out (general engineering) should be considered. Where precision measurement is required, MEM12003B Perform precision mechanical measurement should also be considered. For set-up and operation of electro-discharge (EDM) machines, refer to MEM07014B Perform electro-discharge (EDM) machining operations. **Band**: **A** **Unit Weight**: **8**

Licensing/Regulatory Information

Not Applicable

Pre-Requisites

Prerequisite units		
Path 1	MEM09002B	Interpret technical drawing
	MEM12023A	Perform engineering measurements
	MEM18001C	Use hand tools

Employability Skills Information

Employability skills	This unit contains employability skills.

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Elements and Performance Criteria Pre-Content

Elements describe the essential outcomes of a unit of competency.	Performance criteria describe the performance needed to demonstrate achievement of the element. Where bold italicised text is used, further information is detailed in the required skills and knowledge section and the range statement. Assessment of performance is to be consistent with the evidence guide.

Elements and Performance Criteria

ELEMENT	PERFORMANCE CRITERIA
1. Determine job requirements	1.1. Drawings, instructions and specifications are interpreted and understood
2. Determine sequence of operations	2.1. Sequence of operations including job set-up is determined for maximum efficiency and to meet job specifications 2.2. Appropriate material is selected and datum established as required
3. Select and mount tools	3.1. Appropriate tools for job are selected, sharpened and shaped as required 3.2. Tools are mounted and positioned correctly
4. Perform machining operations	4.1. Basic marking out techniques are used where required 4.2. Machining parameters are set for job requirements and maximum tool life 4.3. Work is held or correctly clamped without damage to product, and all safety requirements are met 4.4. Machining is performed in a safe manner utilising all guards, safety procedures and personal protective clothing and equipment
5. Measure components	5.1. Components are checked with instruments or gauges appropriate to the measurement requirements to ensure compliance with specifications
6. Adjust and maintain machine	6.1. Routine maintenance and adjustments are carried out as required which may include slide and collar adjustment, cleaning and lubrication

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Required Skills and Knowledge

REQUIRED SKILLS AND KNOWLEDGE

This section describes the skills and knowledge required for this unit.

Required skills

Required skills include:

- reading and interpreting routine information on written job instructions, specifications and standard operating procedures which may include drawings
- following oral instruction
- planning and sequencing operations
- preparing operational work plan
- sharpening and shaping cutting tools
- identifying worn or damaged cutting tools
- correct mounting and positioning of cutting tools
- basic marking out of materials
- setting machining parameters to achieve the job requirements and maximise tool life
- using appropriate and sufficient clamping/mounting of the work piece
- using coolant/lubricant correctly
- checking for conformance to specifications
- measuring to specified tolerances and dimensions

Required knowledge

Required knowledge includes:

- reasons for selecting the chosen sequence of operations
- methods of work holding
- basic marking out techniques including datum points/lines
- geometry of cutting tools for a range of materials and applications
- benefits of using correctly sharpened cutting tools
- machine operation
- selection of feeds and speeds to suit a range of materials and operations within the scope of this unit
- correct methods of mounting a variety of cutting tools
- safety issues with regard to correct clamping, guards and shields
- tolerances and limits of size
- situations indicating the need for machine adjustment, lubrication and cleaning
- techniques, tools and equipment to measure materials and machined components

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REQUIRED SKILLS AND KNOWLEDGE
• use and application of personal protective equipment • safe work practices and procedures • hazards and control measures associated with general machining

Evidence Guide

EVIDENCE GUIDE	
The evidence guide provides advice on assessment and must be read in conjunction with the performance criteria, required skills and knowledge, range statement and the Assessment Guidelines for the Training Package.	
Overview of assessment	A person who demonstrates competency in this unit must be able to perform general machining including responsibility for selecting and mounting tooling and setting machining parameters. Competency in this unit cannot be claimed until all prerequisites have been satisfied
Critical aspects for assessment and evidence required to demonstrate competency in this unit	Assessors must be satisfied that the candidate can competently and consistently apply the skills covered in this unit of competency in new and different situations and contexts. Critical aspects of assessment and evidence include: • correct job planning including identifying job requirements from drawings, instructions or specifications and sequence of operations • identifying any required tooling, measuring equipment and accessories • selecting and mounting required tooling • selecting material and marking out if required • setting machining parameters • checking machined components for conformance to specifications.
Context of and specific resources for assessment	This unit has been developed to support training in and recognition of trade level competency in general machining as applied to a trade level fitting and machining, other trade or senior operator work environment. Assessment should emphasise a workplace context and procedures found in the candidate's

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EVIDENCE GUIDE	
	workplace. The competencies covered by this unit would be demonstrated by an individual working alone or as part of a team. The assessment environment should not disadvantage the candidate.
Method of assessment	Typically Engineering Tradespersons - Mechanical and other persons engaged in general machining work are required to apply their machining skills and techniques across a range of jobs and specifications. A single assessment event is not appropriate. On the job assessment should be included as part of the assessment process wherever possible. Where assessment occurs off the job, judgement must consider evidence of the candidate's performance in a productive work environment that includes a sufficient range of appropriate tasks and materials to cover the scope of application for this unit. Assessors should gather a range of evidence that is valid, sufficient, current and authentic. Evidence can be gathered through a variety of ways including direct observation, supervisor's reports, project work, samples and questioning. Questioning techniques should not require language, literacy and numeracy skills beyond those required in this unit of competency. The candidate must have access to all tools, equipment, materials and documentation required. The candidate must be permitted to refer to any relevant workplace procedures, product and manufacturing specifications, codes, standards, manuals and reference materials.
Guidance information for assessment	This unit could be assessed in conjunction with any other units addressing the safety, quality, communication, materials handling, recording and reporting associated with performing general machining or other units requiring the exercise of the skills and knowledge covered by this unit. Assessors must be satisfied that the candidate can competently and consistently perform all elements of the unit as specified by the criteria, including required knowledge, and be capable of applying the competency in new and different situations and contexts.

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Range Statement

RANGE STATEMENT	
The range statement relates to the unit of competency as a whole. It allows for different work environments and situations that may affect performance. Bold italicised wording, if used in the performance criteria, is detailed below. Essential operating conditions that may be present with training and assessment (depending on the work situation, needs of the candidate, accessibility of the item, and local industry and regional contexts) may also be included.	
Operations	Operations may include: • parallel cutting • slotting • planing • drilling • knurling • cutting flats • non-precision surface grinding operations
Materials	Materials may include ferrous and non-ferrous
Tools	Tools may include: • cutting tools and accessories • measuring devices
Marking out techniques	Marking out techniques may include basic marking out techniques using calipers, steel rules, dividers and scribers
Machining parameters	Machining parameters may include: • speeds • feeds • stops • coolant and cutting lubricants
Machines	Machines may include: • lathes • mills • planers • shapers • radial arm drills • slotters

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RANGE STATEMENT	
	• surface grinder
Maintenance and adjustments	Maintenance and adjustments may include: • slide and collar adjustment • cleaning and lubrication

Unit Sector(s)

Unit sector	

Co-requisite units

Co-requisite units		

Competency field

Competency field	Machine and process operations

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MEM07006C Perform lathe operations

Modification History

Not Applicable

Unit Descriptor

Unit descriptor	This unit of competency covers performing machining operations on a lathe to produce components to required tolerances and specifications using all types of accessories except for the use of taper turning attachment and copy turning attachments. The unit does not cover turning of multi-start threads.

Application of the Unit

Application of the unit	This unit of competency applies to the production of components using centre lathes and lathe accessories, precision measuring equipment and cutting tools on a range of standard engineering materials. It does not include use of a taper turning attachment, copy turning attachment or multi-start threads. Work is performed to established processes, practices and specifications. Cutting tools are selected using International Standard Organisation (ISO) standards or according to standard operating procedure as appropriate. Work is performed to drawings, sketches, specifications and instructions as appropriate. This unit has been developed for Engineering Tradesperson - Mechanical apprenticeship training and the recognition of trade level skills in lathe operations. Skills covered by this unit are generally applied in occupational and work situations associated with trade level fitting and machining work. This unit has application in the MEM30205 Certificate III in Engineering - Mechanical qualification and other qualifications requiring a trade level of lathe operation skills. Lathe operations may also be known as turning and the processes and associated level of skill covered by this unit are often described in industry by the term '1st Class

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	Machining'. **Band**: **A** **Unit Weight**: **4**

Licensing/Regulatory Information

Not Applicable

Pre-Requisites

Prerequisite units		
Path 1	MEM07005C	Perform general machining
	MEM09002B	Interpret technical drawing
	MEM12023A	Perform engineering measurements
	MEM18001C	Use hand tools

Employability Skills Information

Employability skills	This unit contains employability skills.

Elements and Performance Criteria Pre-Content

Elements describe the essential outcomes of a unit of competency.	Performance criteria describe the performance needed to demonstrate achievement of the element. Where bold italicised text is used, further information is detailed in the required skills and knowledge section and the range statement. Assessment of performance is to be consistent with the evidence guide.

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Elements and Performance Criteria

ELEMENT	PERFORMANCE CRITERIA
1. Observe safety precautions	1.1. Correct safety procedures are observed and protective clothing and safety glasses worn
2. Determine job requirements	2.1. Drawings are interpreted, sequence of operation is determined and tooling is selected to produce component to specification
3. Mount job	3.1. Job is set up using instruments such as dial test indicators, and digital read-out equipment
4. Perform turning operations	4.1. Speeds and feeds are calculated using appropriate mathematical techniques and reference material 4.2. The full range of accessories on a centre lathe are used including three and four jaw chucks, centres, face plate, steadies, cross slide and tailstock 4.3. Turning operations are performed to specification
5. Check components for conformance with specifications	5.1. Components are checked for conformance to specification using appropriate techniques, tools and equipment

Required Skills and Knowledge

REQUIRED SKILLS AND KNOWLEDGE

This section describes the skills and knowledge required for this unit.

Required skills

Required skills include:

- interpreting technical drawings/specifications in relation to turning
- setting up jobs using appropriate equipment
- calculating and setting cutting feeds and speeds appropriate to the job
- checking that job is concentric and running true
- safely operating lathes
- performing turning operations

Required knowledge

Required knowledge includes:

- sequence of operations to achieve the job requirements

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REQUIRED SKILLS AND KNOWLEDGE
• tool type and geometry to achieve the required specifications and for work pieces of different materials • numerical operations, geometry and calculations/formulae within the scope of this unit • the consequences of varying speeds and feeds from the optimum rates calculated • characteristics of different materials and their effects on cutting speeds and feeds • application of lathe accessories • techniques, tools and equipment to measure materials and machined components • use and application of personal protective equipment • safe work practices and procedures • hazards and control measures associated with lathe operations

Evidence Guide

EVIDENCE GUIDE	
The evidence guide provides advice on assessment and must be read in conjunction with the performance criteria, required skills and knowledge, range statement and the Assessment Guidelines for the Training Package.	
Overview of assessment	A person who demonstrates competency in this unit must be able to perform a variety of lathe operations to specifications. Competency in this unit cannot be claimed until all prerequisites have been satisfied
Critical aspects for assessment and evidence required to demonstrate competency in this unit	Assessors must be satisfied that the candidate can competently and consistently apply the skills covered in this unit of competency in new and different situations and contexts. Critical aspects of assessment and evidence include: • determining requirements for turning job including quantity, material, measurements and tolerances • correct job planning including identifying required measuring equipment, tooling, accessories and sequence of operations • correct preparation of high speed steel tooling • correct fixing of job and tooling • calculating and setting of required speeds and feeds • correct monitoring of turning operation • turning undertaken to trade standard in terms of time

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EVIDENCE GUIDE	
	and responsibility for own work • undertaking correct remedial procedures for out of specification results as per enterprise procedures e.g. procedures for scrapping or reworking of components not turned to specification.
Context of and specific resources for assessment	This unit has been developed to support training in and recognition of trade level competency in lathe operations as applied to a trade level fitting and machining work environment. Assessment should emphasise a workplace context and procedures found in the candidate's workplace. The competencies covered by this unit would be demonstrated by an individual working alone or as part of a team. The assessment environment should not disadvantage the candidate.
Method of assessment	Typically, persons engaged in Engineering Tradesperson - Mechanical work are required to apply their lathe operations skills and techniques across a range of jobs and specifications. A single assessment event is not appropriate. On the job assessment should be included as part of the assessment process wherever possible. Where assessment occurs off the job, judgement must consider evidence of the candidate's performance in a productive work environment that includes a sufficient range of appropriate tasks and materials to cover the scope of application for this unit. Assessors should gather a range of evidence that is valid, sufficient, current and authentic. Evidence can be gathered through a variety of ways including direct observation, supervisor's reports, project work, samples and questioning. Questioning techniques should not require language, literacy and numeracy skills beyond those required in this unit of competency. The candidate must have access to all tools, equipment, materials and documentation required. The candidate must be permitted to refer to any relevant workplace procedures, product and manufacturing specifications, codes, standards, manuals and reference materials.
Guidance information for assessment	This unit could be assessed in conjunction with any other units addressing the safety, quality, communication, materials handling, recording and reporting associated

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EVIDENCE GUIDE	
	with lathe operations or other units requiring the exercise of the skills and knowledge covered by this unit. Assessors must be satisfied that the candidate can competently and consistently perform all elements of the unit as specified by the criteria, including required knowledge, and be capable of applying the competency in new and different situations and contexts.

Range Statement

RANGE STATEMENT	
The range statement relates to the unit of competency as a whole. It allows for different work environments and situations that may affect performance. Bold italicised wording, if used in the performance criteria, is detailed below. Essential operating conditions that may be present with training and assessment (depending on the work situation, needs of the candidate, accessibility of the item, and local industry and regional contexts) may also be included.	
Drawings	Drawings include engineering drawings to AS 1100/1102
Tooling	Tooling includes: • high speed steel, tungsten carbide, ceramic graphite and other standard cutting tools • boring bars • drills • reamers • thread chasers • tapping heads • taps
Instruments	Instruments may include: • manual and digital micrometers • vernier calipers • dial indicators • scribing blocks
Speeds and feeds	Speeds and feeds may include: • setting up machine

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RANGE STATEMENT	
	• changing gears and speeds • use of lead screw • calculations
Accessories	Accessories may include: • three and four jaw chucks • centres • face plate • steadies • cross slide • tailstock
Turning operations	Turning operations may include: • manual parallel and taper turning • internal and external turning including boring drilling, reaming, single start thread cutting and parting off

Unit Sector(s)

Unit sector	

Co-requisite units

Co-requisite units		

Competency field

Competency field	Machine and process operations

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MEM07007C Perform milling operations

Modification History

Not Applicable

Unit Descriptor

Unit descriptor	This unit of competency covers performing machining operations on a range of milling machines to produce components to required tolerances and specifications using all types of accessories.

Application of the Unit

Application of the unit	This unit of competency applies to a range of milling machines including vertical, horizontal and universal types, a range of precision measuring equipment and cutting tools. Work is performed to established processes, practices and to drawings, sketches, specifications and instructions as appropriate. Cutting tools are selected using International Standard Organisation (ISO) standards or according to standard operating procedure as appropriate. This unit has been developed for Engineering Tradesperson - Mechanical apprenticeship training and the recognition of trade level skills in milling operations. Skills covered by this unit are generally applied in occupational and work situations associated with trade level fitting and machining work. This unit has application in the MEM30205 Certificate III in Engineering - Mechanical qualification and other qualifications requiring a trade level of mill machine operation skills. Milling operations and the processes and associated level of skill covered by this unit are often described in industry by the term '1st Class Machining'. **Band**: **A** **Unit Weight**: **4**

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Licensing/Regulatory Information

Not Applicable

Pre-Requisites

Prerequisite units		
Path 1	MEM07005C	Perform general machining
	MEM09002B	Interpret technical drawing
	MEM12023A	Perform engineering measurements
	MEM18001C	Use hand tools

Employability Skills Information

Employability skills	This unit contains employability skills.

Elements and Performance Criteria Pre-Content

Elements describe the essential outcomes of a unit of competency.	Performance criteria describe the performance needed to demonstrate achievement of the element. Where bold italicised text is used, further information is detailed in the required skills and knowledge section and the range statement. Assessment of performance is to be consistent with the evidence guide.

Elements and Performance Criteria

ELEMENT	**PERFORMANCE CRITERIA**
1. Observe safety	1.1. Correct safety procedures are observed and

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ELEMENT	PERFORMANCE CRITERIA
precautions	protective clothing and safety glasses worn
2. Determine job requirements	2.1. Drawings are interpreted, sequence of operation is determined and tooling is selected to produce component to specification 2.2. Cutting parameters are determined
3. Perform milling operations	3.1. Milling operations are carried out to produce components to specification 3.2. Operations are undertaken using conventional and/or climb milling techniques and a variety of cutters including slab, gang, end, shell, slot, form, slitting 3.3. The full range of standard accessories is used including dividing heads and rotary tables as required
4. Check components for conformance with specifications	4.1. Components are checked for conformance to specification using appropriate techniques, tools, instruments and equipment

Required Skills and Knowledge

REQUIRED SKILLS AND KNOWLEDGE
This section describes the skills and knowledge required for this unit.
Required skills
Required skills include: • setting up jobs using appropriate equipment • calculating and setting cutting feeds and speeds appropriate to the job • interpreting drawings and job instructions/specifications • milling components to specification • visually and dimensionally checking components for conformance to specification
Required knowledge
Required knowledge includes: • safety hazards associated with milling machines • sequence of operations to achieve the job requirements • cutter types and tooling geometry • consequences of varying speeds and feeds from the optimum rates calculated

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REQUIRED SKILLS AND KNOWLEDGE
• effects of different materials on cutting speeds and feeds • conventional and climb milling techniques and their applications • the application of each of the following: slab, gang, shell, slot, form and slitting • applications requiring the use of dividing heads and rotary tables when milling components • the procedures for using dividing heads and rotary tables on milling machines • appropriate techniques, tools and equipment to measure milled components • use and application of personal protective equipment • safe work practices and procedures

Evidence Guide

EVIDENCE GUIDE	
The evidence guide provides advice on assessment and must be read in conjunction with the performance criteria, required skills and knowledge, range statement and the Assessment Guidelines for the Training Package.	
Overview of assessment	A person who demonstrates competency in this unit must be able to perform a variety of milling operations to specifications. Competency in this unit cannot be claimed until all prerequisites have been satisfied
Critical aspects for assessment and evidence required to demonstrate competency in this unit	Assessors must be satisfied that the candidate can competently and consistently apply the skills covered in this unit of competency in new and different situations and contexts. Critical aspects of assessment and evidence include: • determining requirements for milling job including quantity, material, measurements and tolerances • correct job planning including identifying required measuring instruments and equipment, tooling, accessories and sequence of operations • correct fixing of job and tooling • calculation and setting of required speed and feed • correct monitoring of milling operation • milling undertaken to trade standard in terms of time and responsibility for own work • undertaking correct remedial procedures for out of specification results as per enterprise procedures e.g.

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EVIDENCE GUIDE	
	procedures for scrapping or reworking of components not milled to specification.
Context of and specific resources for assessment	This unit has been developed to support training in and recognition of trade level competency in milling operations as applied to a trade level fitting and machining work environment. Assessment should emphasise a workplace context and procedures found in the candidate's workplace. The competencies covered by this unit would be demonstrated by an individual working alone or as part of a team. The assessment environment should not disadvantage the candidate.
Method of assessment	Typically, persons engaged in Engineering Tradesperson - Mechanical work are required to apply their milling operations skills and techniques across a range of jobs and specifications. A single assessment event is not appropriate. On the job assessment should be included as part of the assessment process wherever possible. Where assessment occurs off the job, judgement must consider evidence of the candidate's performance in a productive work environment that includes a sufficient range of appropriate tasks and materials to cover the scope of application for this unit. Assessors should gather a range of evidence that is valid, sufficient, current and authentic. Evidence can be gathered through a variety of ways including direct observation, supervisor's reports, project work, samples and questioning. Questioning techniques should not require language, literacy and numeracy skills beyond those required in this unit of competency. The candidate must have access to all tools, equipment, materials and documentation required. The candidate must be permitted to refer to any relevant workplace procedures, product and manufacturing specifications, codes, standards, manuals and reference materials.
Guidance information for assessment	This unit could be assessed in conjunction with any other units addressing the safety, quality, communication, materials handling, recording and reporting associated with milling operations or other units requiring the exercise of the skills and knowledge covered by this unit.

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EVIDENCE GUIDE	
	Assessors must be satisfied that the candidate can competently and consistently perform all elements of the unit as specified by the criteria, including required knowledge, and be capable of applying the competency in new and different situations and contexts.

Range Statement

RANGE STATEMENT	
The range statement relates to the unit of competency as a whole. It allows for different work environments and situations that may affect performance. Bold italicised wording, if used in the performance criteria, is detailed below. Essential operating conditions that may be present with training and assessment (depending on the work situation, needs of the candidate, accessibility of the item, and local industry and regional contexts) may also be included.	
Drawings	Drawings include engineering drawings to AS 1100/1102
Tooling	Tooling includes: • slab • gang • end • shell • slot • form • slitting cutters
Instruments	Instruments may include: • manual and digital micrometers • vernier calipers • dial indicators • scribing blocks
Cutting parameters	Cutting parameters may include setting up machine, feed and speed calculations
Accessories	Accessories may include dividing heads and rotary tables

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Unit Sector(s)

Unit sector	

Co-requisite units

Co-requisite units		

Competency field

Competency field	Machine and process operations

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MEM07008D Perform grinding operations

Modification History

Not Applicable

Unit Descriptor

Unit descriptor	This unit of competency covers determining the job requirements, observing safety precautions, selecting appropriate wheels and accessories, performing the grinding operations and checking the components for conformance to specifications.

Application of the Unit

Application of the unit	This unit of competency applies to grinding operations performed on surface, cylindrical and centreless grinding machines. It requires use of measuring equipment and standard engineering materials and tooling. Work is performed to established processes, practices and to drawings, sketches, specifications and instructions as appropriate. This unit has been developed for Engineering Tradesperson - Mechanical apprenticeship training and the recognition of trade level skills in grinding operations. Skills covered by this unit are generally applied in occupational and work situations associated with trade level fitting and machining work. This unit has application in the MEM30205 Certificate III in Engineering - Mechanical qualification and other qualifications requiring a trade level of grinding machine operation skills. Grinding operations and the processes and associated level of skill covered by this unit are often described in industry by the term '1st Class Machining'. Where precision mechanical measurement is required, MEM12003B Perform precision mechanical measurement should also be considered.

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	Band: **A** **Unit Weight**: **4**

Licensing/Regulatory Information

Not Applicable

Pre-Requisites

Prerequisite units		
Path 1	MEM07005C	Perform general machining
	MEM09002B	Interpret technical drawing
	MEM12023A	Perform engineering measurements
	MEM18001C	Use hand tools

Employability Skills Information

Employability skills	This unit contains employability skills.

Elements and Performance Criteria Pre-Content

Elements describe the essential outcomes of a unit of competency.	Performance criteria describe the performance needed to demonstrate achievement of the element. Where bold italicised text is used, further information is detailed in the required skills and knowledge section and the range statement. Assessment of performance is to be consistent with the evidence guide.

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Elements and Performance Criteria

ELEMENT	PERFORMANCE CRITERIA
1. Determine job requirements	1.1. Job requirements are determined from specifications, and sequence of operations is determined 1.2. Correct and appropriate holding devices are selected and applied
2. Observe safety precautions	2.1. Machine guards, coolant and dust extraction devices are checked 2.2. Correct safety procedures are observed and protective clothing and safety glasses are worn
3. Select grinding wheels and accessories	3.1. Wheels are selected, balanced and dressed based on knowledge of grinding wheel structure and application 3.2. Accessories are selected to facilitate production to job specifications
4. Perform grinding operations	4.1. Grinding machine is set up and adjusted in accordance with defined procedures 4.2. Work piece is held or clamped appropriately to avoid damage 4.3. Grinding operations are performed safely, utilising all guards, safety procedures and personal protective clothing and equipment
5. Check components for conformance with specifications	5.1. Components are checked for conformance to specification using appropriate techniques, tools and equipment

Required Skills and Knowledge

REQUIRED SKILLS AND KNOWLEDGE

This section describes the skills and knowledge required for this unit.

Required skills

Required skills include:

- reading and interpreting information on written job instructions, procedures, specifications, charts, lists, drawings and other applicable reference documents
- checking and clarifying task related information
- preparing an operational work plan

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REQUIRED SKILLS AND KNOWLEDGE
• planning and sequencing operations • using precision measurement equipment within the scope of this unit • setting up work using tools, techniques and equipment • using coolant and dust extraction devices • selecting and preparing grinding wheels and accessories appropriate to the grinding task • performing and monitoring internal/external cylindrical grinding process • clamping/mounting work pieces • checking for conformance to specifications • performing numerical operations and calculations within the scope of this unit
Required knowledge
Required knowledge includes: • reasons for selecting the chosen sequence of operations • the application of a range of holding devices/accessories • reasons for selecting specific work holding devices, tools, techniques and equipment • coolant selection/function • standard grinding wheel shapes • the range of abrasive materials used in grinding wheels • factors impacting grinding wheel selection including grain size of abrasive particles, grade or strength of bond and bond material • grinding wheel dressing tools and their application • internal/external cylindrical grinding process • principles of effective clamping • grinding operations/procedures • the function of any grinding accessories • tools, techniques and equipment for checking components for conformance to specifications • hazards and control measures associated with grinding operations, including housekeeping • use and application of personal protective equipment • safe work practices and procedures

Evidence Guide

EVIDENCE GUIDE

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EVIDENCE GUIDE	
The evidence guide provides advice on assessment and must be read in conjunction with the performance criteria, required skills and knowledge, range statement and the Assessment Guidelines for the Training Package.	
Overview of assessment	A person who demonstrates competency in this unit must be able to perform a variety of grinding operations to specifications. Competency in this unit cannot be claimed until all prerequisites have been satisfied.
Critical aspects for assessment and evidence required to demonstrate competency in this unit	Assessors must be satisfied that the candidate can competently and consistently apply the skills covered in this unit of competency in new and different situations and contexts. Critical aspects of assessment and evidence include: • determining requirements for grinding job including quantity, material, measurements and tolerances • correct job planning including identifying required measuring instruments and equipment, safety equipment, holding devices, grinding wheels, accessories and sequence of operations • identifying guard, coolant and dust extraction requirements and checking equipment and coolant before grinding operation • correct fixing of job • correct monitoring of grinding operation • undertaking grinding to trade standard in terms of time and responsibility for own work • undertaking correct remedial procedures for out of specification results as per enterprise procedures e.g. procedures for scrapping or reworking of components not ground to specification.
Context of and specific resources for assessment	This unit has been developed to support training in and recognition of trade level competency in grinding operations as applied to a trade level fitting and machining work environment. Assessment should emphasise a workplace context and procedures found in the candidate's workplace. The competencies covered by this unit would be demonstrated by an individual working alone or as part of a team. The assessment environment should not disadvantage the candidate.
Method of assessment	Typically, persons engaged in Engineering Tradesperson - Mechanical work are required to apply their grinding

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EVIDENCE GUIDE	
	operations skills and techniques across a range of jobs and specifications. A single assessment event is not appropriate. On the job assessment should be included as part of the assessment process wherever possible. Where assessment occurs off the job, judgement must consider evidence of the candidate's performance in a productive work environment that includes a sufficient range of appropriate tasks and materials to cover the scope of application for this unit. Assessors should gather a range of evidence that is valid, sufficient, current and authentic. Evidence can be gathered through a variety of ways including direct observation, supervisor's reports, project work, samples and questioning. Questioning techniques should not require language, literacy and numeracy skills beyond those required in this unit of competency. The candidate must have access to all tools, equipment, materials and documentation required. The candidate must be permitted to refer to any relevant workplace procedures, product and manufacturing specifications, codes, standards, manuals and reference materials.
Guidance information for assessment	This unit could be assessed in conjunction with any other units addressing the safety, quality, communication, materials handling, recording and reporting associated with grinding operations or other units requiring the exercise of the skills and knowledge covered by this unit. Assessors must be satisfied that the candidate can competently and consistently perform all elements of the unit as specified by the criteria, including required knowledge, and be capable of applying the competency in new and different situations and contexts.

Range Statement

RANGE STATEMENT
The range statement relates to the unit of competency as a whole. It allows for different work environments and situations that may affect performance. Bold italicised wording, if used in the performance criteria, is detailed below. Essential operating

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RANGE STATEMENT	
conditions that may be present with training and assessment (depending on the work situation, needs of the candidate, accessibility of the item, and local industry and regional contexts) may also be included.	
Specifications	Specifications may include: • dimensions and tolerances • geometry and tolerances • surface finish
Holding devices	Holding devices may include: • vices • clamps • magnetic chucks • face plates • collets • 3/4 jaw chuck
Wheels	Wheels may include: • shape • grit/bond composition
Balanced	Balanced may include static and dynamic balancing
Grinding machines	Grinding machines may include surface, cylindrical and centreless machines

Unit Sector(s)

Unit sector	

Co-requisite units

Co-requisite units		

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Co-requisite units		

Competency field

Competency field	Machine and process operations

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MEM07011B Perform complex milling operations

Modification History

Not Applicable

Unit Descriptor

Unit descriptor	This unit covers performing complex milling operations, including gear cutting and helical milling of a range of materials.

Application of the Unit

Application of the unit	This unit applies to a range of complex milling operations including those jobs requiring high precision or quality across a range of materials including non-standard metals and alloys. It also includes those operations requiring complex calculations. **Band**: **A** **Unit Weight**: **4**

Licensing/Regulatory Information

Not Applicable

Pre-Requisites

Prerequisite units		
Path 1	MEM07005C	Perform general machining
	MEM07007C	Perform milling operations
	MEM09002B	Interpret technical drawing

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Prerequisite units		
	MEM12003B	Perform precision mechanical measurement
	MEM12023A	Perform engineering measurements
	MEM12024A	Perform computations
	MEM18001C	Use hand tools

Employability Skills Information

Employability skills	This unit contains employability skills.

Elements and Performance Criteria Pre-Content

Elements describe the essential outcomes of a unit of competency.	Performance criteria describe the performance needed to demonstrate achievement of the element. Where bold italicised text is used, further information is detailed in the required skills and knowledge section and the range statement. Assessment of performance is to be consistent with the evidence guide.

Elements and Performance Criteria

ELEMENT	**PERFORMANCE CRITERIA**
1. Select milling cutters	1.1. Correct milling cutter/s are selected for required operation. 1.2. Correct cutter inserts are selected as required using International Standard Organisation standards and mounted in cutter blank. 1.3. Cutter is mounted to machine spindle and checked for concentricity.
2. Set up work	2.1. Cutting parameters and steps required to mill given component/s are identified.

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ELEMENT	PERFORMANCE CRITERIA
	2.2. Machine is set up with appropriate accessories as required for milling operation. 2.3. Work is set up to required level of accuracy.
3. Perform complex milling	3.1. Components are milled and associated calculations are performed as necessary to achieve specification. 3.2. Components are verified using appropriate precision measuring equipment and reworked as necessary to meet specification.

Required Skills and Knowledge

REQUIRED SKILLS AND KNOWLEDGE

This section describes the skills and knowledge required for this unit.

Required skills

Look for evidence that confirms skills in:

- reading, interpreting and following information on written job instructions, specifications, standard operating procedures, charts, lists, drawings and other applicable reference documents
- planning and sequencing operations
- checking and clarifying work related information
- setting up work to the required level of accuracy
- determining cutting parameters
- selecting the correct milling cutter inserts for the cutting parameters in accordance with ISO standards
- calculating cutting parameters such as speeds, feeds and ratios
- setting up gear trains according to calculations and standard operating procedures
- safely operating milling machine
- performing complex milling operations using dividing heads and omniversal tables

Required knowledge

Look for evidence that confirms knowledge of:

- precision measuring equipment and their applications
- procedures for accurately setting up work
- ISO standards applicable to milling cutter inserts
- procedures for milling components such as racks and gears
- calculations, geometry and formulae relating complex milling activities

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REQUIRED SKILLS AND KNOWLEDGE
• accessories used for complex milling • the applications and use of omniversal tables and differential dividing heads to complex milling operations • hazards and control measures associated with complex milling operations, including housekeeping • safe work practices and procedures

Evidence Guide

EVIDENCE GUIDE	
The evidence guide provides advice on assessment and must be read in conjunction with the performance criteria, required skills and knowledge, range statement and the Assessment Guidelines for the Training Package.	
Overview of assessment	A person who demonstrates competency in this unit must be able to perform complex milling operations. Competency in this unit cannot be claimed until all prerequisites have been satisfied.
Critical aspects for assessment and evidence required to demonstrate competency in this unit	Assessors must be satisfied that the candidate can competently and consistently perform all elements of the unit as specified by the criteria, including required knowledge, and be capable of applying the competency in new and different situations and contexts.
Context of and specific resources for assessment	This unit may be assessed on the job, off the job or a combination of both on and off the job. Where assessment occurs off the job, that is the candidate is not in productive work, then an appropriate simulation must be used where the range of conditions reflects realistic workplace situations. The competencies covered by this unit would be demonstrated by an individual working alone or as part of a team. The assessment environment should not disadvantage the candidate. This unit could be assessed in conjunction with any other units addressing the safety, quality, communication, materials handling, recording and reporting associated with performing complex milling operations or other units requiring the exercise of the skills and knowledge covered by this unit.

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EVIDENCE GUIDE	
Method of assessment	Assessors should gather a range of evidence that is valid, sufficient, current and authentic. Evidence can be gathered through a variety of ways including direct observation, supervisor's reports, project work, samples and questioning. Questioning techniques should not require language, literacy and numeracy skills beyond those required in this unit of competency. The candidate must have access to all tools, equipment, materials and documentation required. The candidate must be permitted to refer to any relevant workplace procedures, product and manufacturing specifications, codes, standards, manuals and reference materials.
Guidance information for assessment	

Range Statement

RANGE STATEMENT	
The range statement relates to the unit of competency as a whole. It allows for different work environments and situations that may affect performance. Bold italicised wording, if used in the performance criteria, is detailed below. Essential operating conditions that may be present with training and assessment (depending on the work situation, needs of the candidate, accessibility of the item, and local industry and regional contexts) may also be included.	
Complex milling operations	Cutting of spur gears, racks, helical gears, radial uniform rise cam lobes etc.
Milling cutter/cutters	Ganged cutters, form cutters etc.
Set up	Set up is verified using instruments such as dial test indicators and sine bars etc.
Appropriate accessories	Omniversal tables, differential dividing heads etc.

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Unit Sector(s)

Unit sector	

Co-requisite units

Co-requisite units		

Competency field

Competency field	Machine and process operations

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MEM07012B Perform complex grinding operations

Modification History

Not Applicable

Unit Descriptor

Unit descriptor	This unit covers performing complex grinding operations.

Application of the Unit

Application of the unit	This unit applies to high precision operations such as jig grinding, grinding eccentrics, thread grinding, gauges, shapes and forms etc. Work includes the use of a range of precision measuring instruments. Grinding operations are performed on a variety of materials to achieve high levels of precision for dimensions and finish. **Band**: **A** **Unit Weight**: **4**

Licensing/Regulatory Information

Not Applicable

Pre-Requisites

Prerequisite units		
Path 1	MEM07005C	Perform general machining
	MEM07008D	Perform grinding operations
	MEM09002B	Interpret technical drawing
	MEM12003B	Perform precision mechanical

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Prerequisite units		
		measurement
	MEM12023A	Perform engineering measurements
	MEM18001C	Use hand tools

Employability Skills Information

Employability skills	This unit contains employability skills.

Elements and Performance Criteria Pre-Content

Elements describe the essential outcomes of a unit of competency.	Performance criteria describe the performance needed to demonstrate achievement of the element. Where bold italicised text is used, further information is detailed in the required skills and knowledge section and the range statement. Assessment of performance is to be consistent with the evidence guide.

Elements and Performance Criteria

ELEMENT	**PERFORMANCE CRITERIA**
1. Determine job requirements	1.1. Job requirements are determined from specifications, and sequence of operations is determined.
2. Set up work	2.1. Grinding wheels are selected and dressed to form and size as required. 2.2. Work is set up to required level of accuracy as per specifications.
3. Perform complex grinding	3.1. Specialised grinding operations are performed on components such as jigs, tools and dies, eccentrics, threads, gauge shapes and forms.
4. Check components for conformance to	4.1. Components are checked for conformance to specification using appropriate techniques, tools and

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ELEMENT	PERFORMANCE CRITERIA
specification	equipment.

Required Skills and Knowledge

REQUIRED SKILLS AND KNOWLEDGE
This section describes the skills and knowledge required for this unit.
Required skills
Look for evidence that confirms skills in: • preparing an operational work plan • dressing grinding wheel to form and size • performing specialised grinding operations • reading, interpreting and following information on written job instructions, specifications, charts, lists, drawings and other applicable reference documents • planning and sequencing operations • checking and clarifying information • entering routine and familiar information onto proformas and standard workplace forms • checking for conformance to specifications • using precision measurement equipment within the scope of this unit • measuring components to specified tolerances • performing numerical operations, geometry and calculations/formulae for specialised complex grinding operations
Required knowledge
Look for evidence that confirms knowledge of: • reasons for selecting the chosen sequence of operations • function and application of work holding devices/accessories appropriate to complex grinding • appropriate techniques, tools and equipment to measure machined components • hazards and control measures associated with complex grinding, including housekeeping • use and application of personal protective equipment • safe work practices and procedures

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Evidence Guide

EVIDENCE GUIDE	
The evidence guide provides advice on assessment and must be read in conjunction with the performance criteria, required skills and knowledge, range statement and the Assessment Guidelines for the Training Package.	
Overview of assessment	A person who demonstrates competency in this unit must be able to perform complex grinding operations. Competency in this unit cannot be claimed until all prerequisites have been satisfied.
Critical aspects for assessment and evidence required to demonstrate competency in this unit	Assessors must be satisfied that the candidate can competently and consistently perform all elements of the unit as specified by the criteria, including required knowledge, and be capable of applying the competency in new and different situations and contexts.
Context of and specific resources for assessment	This unit may be assessed on the job, off the job or a combination of both on and off the job. Where assessment occurs off the job, that is the candidate is not in productive work, then an appropriate simulation must be used where the range of conditions reflects realistic workplace situations. The competencies covered by this unit would be demonstrated by an individual working alone or as part of a team. The assessment environment should not disadvantage the candidate. This unit could be assessed in conjunction with any other units addressing the safety, quality, communication, materials handling, recording and reporting associated with complex grinding operations or other units requiring the exercise of the skills and knowledge covered by this unit.
Method of assessment	Assessors should gather a range of evidence that is valid, sufficient, current and authentic. Evidence can be gathered through a variety of ways including direct observation, supervisor's reports, project work, samples and questioning. Questioning techniques should not require language, literacy and numeracy skills beyond those required in this unit of competency. The candidate must have access to all tools, equipment, materials and documentation required. The candidate must be permitted to refer to any relevant workplace procedures, product and manufacturing specifications, codes, standards, manuals and reference materials.

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EVIDENCE GUIDE	
Guidance information for assessment	

Range Statement

RANGE STATEMENT	
The range statement relates to the unit of competency as a whole. It allows for different work environments and situations that may affect performance. Bold italicised wording, if used in the performance criteria, is detailed below. Essential operating conditions that may be present with training and assessment (depending on the work situation, needs of the candidate, accessibility of the item, and local industry and regional contexts) may also be included.	
Grinding wheels	Wheel selection criteria includes shape and grit/bond composition

Unit Sector(s)

Unit sector	

Co-requisite units

Co-requisite units		

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Competency field

Competency field	Machine and process operations

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MEM07021B Perform complex lathe operations

Modification History

Not Applicable

Unit Descriptor

Unit descriptor	This unit covers setting up work, selecting and preparing tooling and performing complex turning operations.

Application of the Unit

Application of the unit	This unit applies to complex, difficult or non-standard turning e.g. single-start and multi-start thread cutting, internal blind hole thread cutting, eccentrics, copy and taper turning, counterbalancing work on face plates, mandrel work, trepanning, heavy (multi-tonne) shafts etc. requiring high precision or quality using a range of materials including non-standard metals and alloys. Work would be performed autonomously using predetermined standards of quality and safety. **Band**: **A** **Unit Weight**: **4**

Licensing/Regulatory Information

Not Applicable

Pre-Requisites

Prerequisite units		
Path 1	MEM07005C	Perform general machining

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Prerequisite units		
	MEM07006C	Perform lathe operations
	MEM09002B	Interpret technical drawing
	MEM12003B	Perform precision mechanical measurement
	MEM12023A	Perform engineering measurements
	MEM12024A	Perform computations
	MEM18001C	Use hand tools

Employability Skills Information

Employability skills	This unit contains employability skills.

Elements and Performance Criteria Pre-Content

Elements describe the essential outcomes of a unit of competency.	Performance criteria describe the performance needed to demonstrate achievement of the element. Where bold italicised text is used, further information is detailed in the required skills and knowledge section and the range statement. Assessment of performance is to be consistent with the evidence guide.

Elements and Performance Criteria

ELEMENT	**PERFORMANCE CRITERIA**
1. Determine sequence of operations	1.1. Sequence of operations including job set-up is determined for maximum efficiency and to meet job specifications.
2. Set up work on lathe	2.1. Work is set up on the lathe to required level of accuracy using precision instruments such as dial test

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ELEMENT	PERFORMANCE CRITERIA
	indicators etc. 2.2. Work piece is balanced as required when using face plates to ensure accuracy in machining. 2.3. Work piece is set up to ensure that work piece is free of distortion following completion of machining.
3. Select and prepare tooling	3.1. Tooling, accessories and consumables are selected appropriate to task, specifications and material. 3.2. Where necessary, cutting tool modifications required to perform complex turning operations are determined. 3.3. Tooling and accessories are prepared and modified as required. 3.4. International Standard Organisation standards for cutting tools or other appropriate standards to suit cutting parameters are applied as necessary.
4. Perform complex turning	4.1. Speeds and feeds are correctly calculated using appropriate mathematical techniques and reference material. 4.2. Complex turning is undertaken to specifications and workplace procedures. 4.3. Work piece is measured and verified to be in accordance with specification using precision measuring equipment.

Required Skills and Knowledge

REQUIRED SKILLS AND KNOWLEDGE
This section describes the skills and knowledge required for this unit.
Required skills
Look for evidence that confirms skills in: • setting up work to the required level of accuracy using appropriate precision measuring equipment • setting and supporting work to avoid distortion on release of clamping devices • selecting correct cutting tools or inserts as appropriate to turning operation • selecting and using appropriate feeds and speeds • performing complex turning operations - counter balancing work on face plates:

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REQUIRED SKILLS AND KNOWLEDGE
• mandrel work • trepanning • heavy (multi-tonne) shafts • calculating cutting parameters, speeds and feeds • reading, interpreting and following information on written job instructions, specifications, charts, lists, drawings and other applicable reference documents • planning and sequencing operations • checking and clarifying task related information • entering routine and familiar information onto proformas and standard workplace forms • checking for conformance to specifications • using precision measurement equipment • measuring components to specified tolerances • performing numerical operations, geometry and calculations/formulae within the scope of this unit • following oral instructions • orally reporting information
Required knowledge
Look for evidence that confirms knowledge of: • precision measuring equipment and measuring techniques within the scope of this unit • reasons for selecting different measuring equipment • procedures for accurately setting up work for a variety of techniques • ISO or other standards applicable to cutting tool inserts • cutting parameters for the given task • feeds and speeds for complex turning operation(s) • formulae and data relating to feeds and speeds • techniques and procedures for carrying out the following turning operations: • single-start thread cutting • multi-start thread cutting • internal blind hole thread cutting • eccentrics • copy turning • taper turning • techniques and procedures for carrying out the following turning operations: • counter balancing work on face plates • mandrel work • trepanning

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REQUIRED SKILLS AND KNOWLEDGE
• heavy (multi-tonne) shafts • hazards and control measures, including housekeeping • use and application of personal protective equipment • safe work practices and procedures

Evidence Guide

EVIDENCE GUIDE	
The evidence guide provides advice on assessment and must be read in conjunction with the performance criteria, required skills and knowledge, range statement and the Assessment Guidelines for the Training Package.	
Overview of assessment	A person who demonstrates competency in this unit must be able to perform complex lathe operations. Competency in this unit cannot be claimed until all prerequisites have been satisfied.
Critical aspects for assessment and evidence required to demonstrate competency in this unit	Assessors must be satisfied that the candidate can competently and consistently perform all elements of the unit as specified by the criteria, including required knowledge, and be capable of applying the competency in new and different situations and contexts.
Context of and specific resources for assessment	This unit may be assessed on the job, off the job or a combination of both on and off the job. Where assessment occurs off the job, that is the candidate is not in productive work, then an appropriate simulation must be used where the range of conditions reflects realistic workplace situations. The competencies covered by this unit would be demonstrated by an individual working alone or as part of a team. The assessment environment should not disadvantage the candidate. This unit could be assessed in conjunction with any other units addressing the safety, quality, communication, materials handling, recording and reporting associated with performing complex lathe operations or other units requiring the exercise of the skills and knowledge covered by this unit.
Method of assessment	Assessors should gather a range of evidence that is valid, sufficient, current and authentic. Evidence can be

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EVIDENCE GUIDE	
	gathered through a variety of ways including direct observation, supervisor's reports, project work, samples and questioning. Questioning techniques should not require language, literacy and numeracy skills beyond those required in this unit of competency. The candidate must have access to all tools, equipment, materials and documentation required. The candidate must be permitted to refer to any relevant workplace procedures, product and manufacturing specifications, codes, standards, manuals and reference materials.
Guidance information for assessment	

Range Statement

RANGE STATEMENT	
The range statement relates to the unit of competency as a whole. It allows for different work environments and situations that may affect performance. Bold italicised wording, if used in the performance criteria, is detailed below. Essential operating conditions that may be present with training and assessment (depending on the work situation, needs of the candidate, accessibility of the item, and local industry and regional contexts) may also be included.	
Lathe	Applicable to all classes of lathes used for complex turning operations
Tooling	Cutting tools, form tools, boring bars, drills, reamers, thread chasers, tapping heads, taps etc.
Complex turning	May include single-start and multi-start thread cutting, internal blind hole thread cutting, eccentrics, copy and taper turning, counterbalancing work on face plates, mandrel work, trepanning, heavy (multi-tonne) shafts etc.

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Unit Sector(s)

Unit sector	

Co-requisite units

Co-requisite units		

Competency field

Competency field	Machine and process operations

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MEM09002B Interpret technical drawing

Modification History

Not Applicable

Unit Descriptor

Unit descriptor	This unit covers interpreting technical drawing applying to any of the full range of engineering disciplines.

Application of the Unit

Application of the unit	Technical drawings may utilise perspective, exploded views or hidden view techniques. Drawings are provided to Australian Standard 1100 and/or Australian Standard 1102 and their equivalents from the full range of engineering disciplines. Standard symbols to Australian Standard 1100 and/or Australian Standard 1102 or equivalent are recognised in field of employment. Technical drawings may include symbol glossaries. Where any drawing, sketch, chart, diagram is only used as the technique for communication, then this unit does not apply: see Unit MEM12023A (perform engineering measurements) or Unit MEM16006A (Organise and communicate information). **Band**: **A** **Unit Weight**: **4**

Licensing/Regulatory Information

Not Applicable

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Pre-Requisites

Prerequisite units		

Employability Skills Information

Employability skills	This unit contains employability skills.

Elements and Performance Criteria Pre-Content

Elements describe the essential outcomes of a unit of competency.	Performance criteria describe the performance needed to demonstrate achievement of the element. Where bold italicised text is used, further information is detailed in the required skills and knowledge section and the range statement. Assessment of performance is to be consistent with the evidence guide.

Elements and Performance Criteria

ELEMENT	**PERFORMANCE CRITERIA**
1. Select correct technical drawing	1.1. Drawing is checked and validated against job requirements or equipment. 1.2. Drawing version is checked and validated.
2. Interpret technical drawing	2.1. Components, assemblies or objects are recognised as required. 2.2. Dimensions are identified as appropriate to field of employment. 2.3. Instructions are identified and followed as required. 2.4. Material requirements are identified as required. 2.5. Symbols are recognised in the drawing as appropriate.

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Required Skills and Knowledge

REQUIRED SKILLS AND KNOWLEDGE

This section describes the skills and knowledge required for this unit.

Required skills

Look for evidence that confirms skills in:

- checking the drawing against job requirements/related equipment in accordance with standard operating procedures
- confirming the drawing version as being current in accordance with standard operating procedures
- where appropriate, obtaining the current version of the drawing in accordance with standard operating procedures
- reading, interpreting information on the drawing, written job instructions, specifications, standard operating procedures, charts, lists and other applicable reference documents
- checking and clarifying task related information
- undertaking numerical operations, geometry and calculations/formulae within the scope of this unit

Required knowledge

Look for evidence that confirms knowledge of:

- application of AS1100.101 in accordance with standard operating procedures
- relationship between the views contained in the drawing
- objects represented in the drawing
- units of measurement used in the preparation of the drawing
- dimensions of the key features of the objects depicted in the drawing
- understanding of the instructions contained in the drawing
- the actions to be undertaken in response to those instructions
- the materials from which the object(s) are made
- any symbols used in the drawing as described in range statement
- hazard and control measures associated with interpreting technical drawings, including housekeeping
- safe work practices and procedures

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Evidence Guide

EVIDENCE GUIDE	
The evidence guide provides advice on assessment and must be read in conjunction with the performance criteria, required skills and knowledge, range statement and the Assessment Guidelines for the Training Package.	
Overview of assessment	A person who demonstrates competency in this unit must be able to interpret technical drawings as described.
Critical aspects for assessment and evidence required to demonstrate competency in this unit	Assessors must be satisfied that the candidate can competently and consistently perform all elements of the unit as specified by the criteria, including required knowledge, and be capable of applying the competency in new and different situations and contexts.
Context of and specific resources for assessment	This unit may be assessed on the job, off the job or a combination of both on and off the job. Where assessment occurs off the job, that is the candidate is not in productive work, then an appropriate simulation must be used where the range of conditions reflects realistic workplace situations. The competencies covered by this unit would be demonstrated by an individual working alone or as part of a team. The assessment environment should not disadvantage the candidate. This unit could be assessed in conjunction with any other units addressing the safety, quality, communication, materials handling, recording and reporting associated with interpreting technical drawings or other units requiring the exercise of the skills and knowledge covered by this unit.
Method of assessment	Assessors should gather a range of evidence that is valid, sufficient, current and authentic. Evidence can be gathered through a variety of ways including direct observation, supervisor's reports, project work, samples and questioning. Questioning should not require language, literacy and numeracy skills beyond those required in this unit. The candidate must have access to all tools, equipment, materials and documentation required. The candidate must be permitted to refer to any relevant workplace procedures, product and manufacturing specifications, codes, standards, manuals and reference materials.
Guidance information for assessment	

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Range Statement

RANGE STATEMENT	
The range statement relates to the unit of competency as a whole. It allows for different work environments and situations that may affect performance. Bold italicised wording, if used in the performance criteria, is detailed below. Essential operating conditions that may be present with training and assessment (depending on the work situation, needs of the candidate, accessibility of the item, and local industry and regional contexts) may also be included.	
Interpret technical drawing	AS1100.101 is an extensive work and the candidate is not required to have complete familiarity with all its contents, the application of AS1100 would usually be in line with standard operating procedures; interpretation may require guidance particularly in respect to any geometric tolerancing

Unit Sector(s)

Unit sector	

Co-requisite units

Co-requisite units		

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Competency field

Competency field	Drawing, drafting and design

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MEM09003B Prepare basic engineering drawing

Modification History

Not Applicable

Unit Descriptor

Unit descriptor	This unit covers identifying the drawing requirements, preparing or making changes to engineering drawings, preparing an engineering parts list and issuing the drawings

Application of the Unit

Application of the unit	The unit applies to the fields of mechanical, electrical/electronic, fabrication, and fluid power. Specifications may be obtained from design information, customer requirements, sketches and preliminary layouts. Manual drafting and drawing equipment is used, or where a Computer Aided Design (CAD) system is used other units should also be considered. This unit applies to any of the full range of engineering disciplines. Where a more extensive Computer Aided Drafting System is used for design, then Unit MEM09009C (Create 2D drawings using computer aided design system), should also be considered. **Band**: **A** **Unit Weight**: **8**

Licensing/Regulatory Information

Not Applicable

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Pre-Requisites

Prerequisite units		
Path 1	MEM09002B	Interpret technical drawing

Employability Skills Information

Employability skills	This unit contains employability skills.

Elements and Performance Criteria Pre-Content

Elements describe the essential outcomes of a unit of competency.	Performance criteria describe the performance needed to demonstrate achievement of the element. Where bold italicised text is used, further information is detailed in the required skills and knowledge section and the range statement. Assessment of performance is to be consistent with the evidence guide.

Elements and Performance Criteria

ELEMENT	**PERFORMANCE CRITERIA**
1. Identify drawing requirements	1.1. Requirements and purpose of drawing are determined from customer and/or work specification and associated documents. 1.2. All data necessary to produce the drawing is identified and collected. 1.3. Drawing requirements are confirmed with relevant personnel and timeframes for completion are established.
2. Prepare or make changes to engineering drawing	2.1. Drafting equipment is selected appropriate to the drawing method chosen. 2.2. Drafting principles are applied to produce a drawing that is consistent with standard operating procedures

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ELEMENT	PERFORMANCE CRITERIA
	within the enterprise. 2.3. All work is undertaken safely and to prescribed procedure. 2.4. Completed drawing is approved in accordance with standard operating procedures.
3. Prepare engineering parts list	3.1. Components parts are identified and organised by component type and/or in accordance with organisation/customer requirements.
4. Issue drawing	4.1. Drawings and or parts lists records are completed in accordance with standard operating procedures. 4.2. Approved drawings and or parts lists are copied and issued to relevant personnel in accordance with standard operating procedures. 4.3. Approved drawings and or parts lists are stored and catalogued in accordance with standard operating procedures.

Required Skills and Knowledge

REQUIRED SKILLS AND KNOWLEDGE

This section describes the skills and knowledge required for this unit.

Required skills

Look for evidence that confirms skills in:

- obtaining all relevant job requirements, data/information and specifications necessary to produce the drawing in accordance with workplace procedures
- using drafting equipment appropriate to the drawing method chosen
- producing/changing the drawing to conform with the relevant standard
- undertaking all work safely and in accordance with workplace procedures
- checking the completed drawing in accordance with standard operating procedures
- producing the component parts list with part name, description of part, material specification or part number, quantities and all other details specified by the customer and/or organisational procedures
- recording completed drawings and or parts lists in accordance with standard operating procedures
- where appropriate, copying and issuing approved drawings and or parts lists in accordance with standard operating procedures

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REQUIRED SKILLS AND KNOWLEDGE

- handling and storing the approved drawings and or parts lists in accordance with standard operating procedures
- reading, interpreting and following information on written job instructions, specifications, standard operating procedures, charts, lists, drawings and other applicable reference documents
- planning and sequencing operations
- checking and clarifying task related information
- undertaking numerical operations, geometry and calculations/formulae within the scope of this unit

Required knowledge

Look for evidence that confirms knowledge of:

- requirements and purpose of the drawing to be produced
- requirements and purpose of the engineering parts list
- sources of relevant data/ information
- timeframe for completion of the drawing(s)
- person(s) who can confirm drawing requirements
- method of drawing preparation
- the reasons for selecting the chosen drawing method
- procedures for producing an initial drawing
- procedures for changing an existing drawing
- drafting principles to be applied to the production/changing of a drawing
- standards to which the drawing is to be produced
- procedures for checking drawings
- the persons responsible for checking and approving drawings
- consequences of inappropriate/incomplete components parts lists
- procedures and reasons for recording completed drawings and or parts lists
- procedures for copying approved drawings and or parts lists
- procedures for issuing approved drawings and or parts lists
- the personnel to whom copies of approved drawings and or parts lists can be issued
- procedures for filing approved drawings and or parts lists
- procedures for safe handling and storage of drawings and or parts lists
- consequences of inappropriate handling and storage of approved drawings and or parts lists
- safe work practices and procedures

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Evidence Guide

EVIDENCE GUIDE	
The evidence guide provides advice on assessment and must be read in conjunction with the performance criteria, required skills and knowledge, range statement and the Assessment Guidelines for the Training Package.	
Overview of assessment	A person who demonstrates competency in this unit must be able to prepare basic engineering drawings. Competency in this unit cannot be claimed until all prerequisites have been satisfied.
Critical aspects for assessment and evidence required to demonstrate competency in this unit	Assessors must be satisfied that the candidate can competently and consistently perform all elements of the unit as specified by the criteria, including required knowledge, and be capable of applying the competency in new and different situations and contexts.
Context of and specific resources for assessment	This unit may be assessed on the job, off the job or a combination of both on and off the job. Where assessment occurs off the job, that is the candidate is not in productive work, then an appropriate simulation must be used where the range of conditions reflects realistic workplace situations. The competencies covered by this unit would be demonstrated by an individual working alone or as part of a team. The assessment environment should not disadvantage the candidate. This unit could be assessed in conjunction with any other units addressing the safety, quality, communication, materials handling, recording and reporting associated with preparing basic engineering drawing or other units requiring the exercise of the skills and knowledge covered by this unit.
Method of assessment	Assessors should gather a range of evidence that is valid, sufficient, current and authentic. Evidence can be gathered through a variety of ways including direct observation, supervisor's reports, project work, samples and questioning. Questioning techniques should not require language, literacy and numeracy skills beyond those required in this unit of competency. The candidate must have access to all tools, equipment, materials and documentation required. The candidate must be permitted to refer to any relevant workplace procedures, product and manufacturing specifications, codes, standards, manuals and reference materials.

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EVIDENCE GUIDE	
Guidance information for assessment	

Range Statement

RANGE STATEMENT	
The range statement relates to the unit of competency as a whole. It allows for different work environments and situations that may affect performance. Bold italicised wording, if used in the performance criteria, is detailed below. Essential operating conditions that may be present with training and assessment (depending on the work situation, needs of the candidate, accessibility of the item, and local industry and regional contexts) may also be included.	
Relevant personnel	Technical personnel, supervisors, manufacturers, suppliers, contractors, customers
Drafting equipment	Drafting and drawing equipment includes the use of Computer Aided Drafting systems
Drafting principles	Drawings are prepared in accordance with Australian Standard 1100.101, or equivalent, as required Interpretation of AS1100.101 or other problems are resolved in consultation with a supervisor
Records	Drawing records may include cataloguing, issuing security classifications, filing, preparing distribution lists
Issued	In hard copy, photographic, slide or transparency form including presentation as a single drawing and/or with other drawings, support documentation as a package

Unit Sector(s)

Unit sector	

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Co-requisite units

Co-requisite units		

Competency field

Competency field	Drawing, drafting and design

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MEM09004B Perform electrical/electronic detail drafting

Modification History

Not Applicable

Unit Descriptor

Unit descriptor	This unit covers producing electrical/electronic drawings under supervision.

Application of the Unit

Application of the unit	This unit applies to the production of drawings under supervision, in accordance with instructions and specifications to Australian Standard 1102 or equivalent using predetermined design specifications. This unit applies to all electrical/electronic areas. Manual drafting or drawing equipment is used or where a CAD system is used, Unit MEM09009C (Create 2D drawings using computer aided design system) and/or Unit MEM09010C (Create 3D models using computer aided design system) should also be considered. **Band**: **B** **Unit Weight**: **8**

Licensing/Regulatory Information

Not Applicable

Pre-Requisites

Prerequisite units	

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Prerequisite units		
Path 1	MEM09002B	Interpret technical drawing
	MEM09003B	Prepare basic engineering drawing

Employability Skills Information

Employability skills	This unit contains employability skills.

Elements and Performance Criteria Pre-Content

Elements describe the essential outcomes of a unit of competency.	Performance criteria describe the performance needed to demonstrate achievement of the element. Where bold italicised text is used, further information is detailed in the required skills and knowledge section and the range statement. Assessment of performance is to be consistent with the evidence guide.

Elements and Performance Criteria

ELEMENT	**PERFORMANCE CRITERIA**
1. Prepare/make changes to electrical/electronic schematics and drawings	1.1. Schematic is drawn to indicate the relative positioning of electrical/electronic components. 1.2. Electrical/electronic drawings are produced to include all relevant specifications. 1.3. Schematic/drawing is completed to Australian Standard 1102 or equivalent.
2. Determine component and/or material requirement	2.1. Components and/or materials are selected from supplier/manufacturers' catalogues using design specifications.

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Required Skills and Knowledge

REQUIRED SKILLS AND KNOWLEDGE

This section describes the skills and knowledge required for this unit.

Required skills

Look for evidence that confirms skills in:

- drawing electrical/electronic schematics correctly and indicating the relative position of the components
- producing electrical/electronic drawings with all relevant specifications
- producing electrical/electronic schematics/drawings in conformance with AS1102 or equivalent
- obtaining the circuit/component specifications
- reading, interpreting and following information on written job instructions, specifications, standard operating procedures, charts, lists, drawings and other applicable documents
- planning and sequencing operations
- checking and clarifying task related information
- undertaking numerical operations, geometry and calculations/formulae within the scope of this unit

Required knowledge

Look for evidence that confirms knowledge of:

- relative position of electrical/electronic components
- symbols used in electrical/electronic schematics and drawings
- specifications of all components
- circuit specifications
- requirements of AS1102 or equivalent with respect to electrical/electronic schematics/drawings
- design specifications of the circuit/components
- appropriate components and materials from supplier/manufacturers' catalogues
- reasons for selecting the chosen components and/or materials
- hazards and control measure associated with performing electrical/electronic detail drafting, including housekeeping
- safe work practices and procedures

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Evidence Guide

EVIDENCE GUIDE	
The evidence guide provides advice on assessment and must be read in conjunction with the performance criteria, required skills and knowledge, range statement and the Assessment Guidelines for the Training Package.	
Overview of assessment	A person who demonstrates competency in this unit must be able to perform electrical/electronic detail drafting. Competency in this unit cannot be claimed until all prerequisites have been satisfied.
Critical aspects for assessment and evidence required to demonstrate competency in this unit	Assessors must be satisfied that the candidate can competently and consistently perform all elements of the unit as specified by the criteria, including required knowledge, and be capable of applying the competency in new and different situations and contexts.
Context of and specific resources for assessment	This unit may be assessed on the job, off the job or a combination of both on and off the job. Where assessment occurs off the job, that is the candidate is not in productive work, then an appropriate simulation must be used where the range of conditions reflects realistic workplace situations. The competencies covered by this unit would be demonstrated by an individual working alone or as part of a team. The assessment environment should not disadvantage the candidate. This unit could be assessed in conjunction with any other units addressing the safety, quality, communication, materials handling, recording and reporting associated with performing electrical/electronic detail drafting or other units requiring the exercise of the skills and knowledge covered by this unit.
Method of assessment	Assessors should gather a range of evidence that is valid, sufficient, current and authentic. Evidence can be gathered through a variety of ways including direct observation, supervisor's reports, project work, samples and questioning. Questioning techniques should not require language, literacy and numeracy skills beyond those required in this unit of competency. The candidate must have access to all tools, equipment, materials and documentation required. The candidate must be permitted to refer to any relevant workplace procedures, product and manufacturing specifications, codes, standards, manuals and reference materials.

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EVIDENCE GUIDE	
Guidance information for assessment	

Range Statement

RANGE STATEMENT	
The range statement relates to the unit of competency as a whole. It allows for different work environments and situations that may affect performance. Bold italicised wording, if used in the performance criteria, is detailed below. Essential operating conditions that may be present with training and assessment (depending on the work situation, needs of the candidate, accessibility of the item, and local industry and regional contexts) may also be included.	
Drawings	Include plans, schematics, layouts, circuit diagrams and charts

Unit Sector(s)

Unit sector	

Co-requisite units

Co-requisite units		

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Competency field

Competency field	Drawing, drafting and design

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MEM09005B Perform basic engineering detail drafting

Modification History

Not Applicable

Unit Descriptor

Unit descriptor	This unit covers producing drawings to Australian Standard 1100 or equivalent where the critical dimensions and associated tolerances and design specifications are predetermined.

Application of the Unit

Application of the unit	Manual drafting or drawing equipment is used or where a CAD (Computer Aided Design) system is used, Unit MEM09009C (Create 2D drawings using computer aided design system) and/or Unit MEM09010C (Create 3D models using computer aided design system) should also be considered. **Band**: **A** **Unit Weight**: **8**

Licensing/Regulatory Information

Not Applicable

Pre-Requisites

Prerequisite units		
Path 1	MEM09002B	Interpret technical drawing
	MEM09003B	Prepare basic engineering drawing

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Employability Skills Information

Employability skills	This unit contains employability skills.

Elements and Performance Criteria Pre-Content

Elements describe the essential outcomes of a unit of competency.	Performance criteria describe the performance needed to demonstrate achievement of the element. Where bold italicised text is used, further information is detailed in the required skills and knowledge section and the range statement. Assessment of performance is to be consistent with the evidence guide.

Elements and Performance Criteria

ELEMENT	PERFORMANCE CRITERIA
1. Prepare assembly, layout and detail drafting	1.1. Drawings are prepared in plane orthogonal, isometric projection or equivalent including auxiliary views and sections to Australian Standard 1100. 1.2. Layout, assembly and component drawings are prepared from specification. 1.3. Drawings are dimensioned and labelled using supplied tolerances in accordance with Australian Standard 1100. 1.4. Drawings are produced to specification in accordance with standard operating procedures. 1.5. Standard symbols to Australian Standard 1100 or equivalent are used to specify requirements.
2. Determine component and/or material requirement	2.1. Components and/or materials are selected from supplier/manufacturers' catalogues using design specifications.

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Required Skills and Knowledge

REQUIRED SKILLS AND KNOWLEDGE

This section describes the skills and knowledge required for this unit.

Required skills

Look for evidence that confirms skills in:

- preparing drawings using appropriate projections and views in accordance with AS1100 or equivalent, see above note in the range statement
- producing layout, assembly and component drawings in conformance with specification
- inserting all relevant dimensions, tolerances and instructions in the drawing
- producing drawings to specification
- appropriately using standard symbols in accordance with AS1100 or equivalent in the drawings produced
- obtaining component specifications in accordance with work place procedures
- reading, interpreting and following information written job instructions, specifications, standard operating procedures, charts, lists, drawings and other applicable reference documents
- planning and sequencing operations
- checking and clarifying task related information
- checking for conformance to specifications
- undertaking numerical operations, geometry and calculations/formulae within the scope of this unit

Required knowledge

Look for evidence that confirms knowledge of:

- appropriate projection for the drawing purpose
- reasons for selecting the chosen projection
- reasons for including auxiliary views in drawings
- requirements of AS1100 or equivalent with respect to dimensions, tolerances and labels
- procedures for producing component, layout and/or assembly drawings
- drawing specifications
- common symbols used in drawings to AS1100 or equivalent
- design specifications of the component
- appropriate components and materials from supplier/manufacturers' catalogues
- reasons for selecting the chosen components and/or materials
- safe work practices and procedures

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Evidence Guide

EVIDENCE GUIDE	
The evidence guide provides advice on assessment and must be read in conjunction with the performance criteria, required skills and knowledge, range statement and the Assessment Guidelines for the Training Package.	
Overview of assessment	A person who demonstrates competency in this unit must be able to perform basic engineering detail drafting. Competency in this unit cannot be claimed until all prerequisites have been satisfied.
Critical aspects for assessment and evidence required to demonstrate competency in this unit	Assessors must be satisfied that the candidate can competently and consistently perform all elements of the unit as specified by the criteria, including required knowledge, and be capable of applying the competency in new and different situations and contexts.
Context of and specific resources for assessment	This unit may be assessed on the job, off the job or a combination of both on and off the job. Where assessment occurs off the job, that is the candidate is not in productive work, then an appropriate simulation must be used where the range of conditions reflects realistic workplace situations. The competencies covered by this unit would be demonstrated by an individual working alone or as part of a team. The assessment environment should not disadvantage the candidate. This unit could be assessed in conjunction with any other units addressing the safety, quality, communication, materials handling, recording and reporting associated with basic engineering detail drafting or other units requiring the exercise of the skills and knowledge covered by this unit.
Method of assessment	Assessors should gather a range of evidence that is valid, sufficient, current and authentic. Evidence can be gathered through a variety of ways including direct observation, supervisor's reports, project work, samples and questioning. Questioning techniques should not require language, literacy and numeracy skills beyond those required in this unit of competency. The candidate must have access to all tools, equipment, materials and documentation required. The candidate must be permitted to refer to any relevant workplace procedures, product and manufacturing specifications, codes,

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EVIDENCE GUIDE	
	standards, manuals and reference materials.
Guidance information for assessment	

Range Statement

RANGE STATEMENT	
The range statement relates to the unit of competency as a whole. It allows for different work environments and situations that may affect performance. Bold italicised wording, if used in the performance criteria, is detailed below. Essential operating conditions that may be present with training and assessment (depending on the work situation, needs of the candidate, accessibility of the item, and local industry and regional contexts) may also be included.	
Australian Standard 1100	AS1100.100 is an extensive work and its application would usually be in line with standard operating procedures; interpretation would be under guidance particularly in respect to any geometric tolerancing

Unit Sector(s)

Unit sector	

Co-requisite units

Co-requisite units		

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Competency field

Competency field	Drawing, drafting and design

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MEM09006B Perform advanced engineering detail drafting

Modification History

Not Applicable

Unit Descriptor

Unit descriptor	This unit covers producing assembly, layout and detail drawings to Australian Standard 1100 or equivalent.

Application of the Unit

Application of the unit	Skills covered by this unit are applied individually or in a team environment where comprehensive responsibility for the production of the drawing is exercised, and critical dimensions and associated tolerances are determined where required. Manual drafting and drawing equipment is used or where a CAD (Computer Aided Design) system is used, Unit MEM09009C (Create 2D drawings using computer aided design system) and/or Unit MEM09010C (Create 3D models using computer aided design system) should also be considered. **Band**: **B** **Unit Weight**: **4**

Licensing/Regulatory Information

Not Applicable

Pre-Requisites

Prerequisite units	

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Prerequisite units		
Path 1	MEM09002B	Interpret technical drawing
	MEM09003B	Prepare basic engineering drawing
	MEM09005B	Basic engineering detail drafting

Employability Skills Information

Employability skills	This unit contains employability skills.

Elements and Performance Criteria Pre-Content

Elements describe the essential outcomes of a unit of competency.	Performance criteria describe the performance needed to demonstrate achievement of the element. Where bold italicised text is used, further information is detailed in the required skills and knowledge section and the range statement. Assessment of performance is to be consistent with the evidence guide.

Elements and Performance Criteria

ELEMENT	**PERFORMANCE CRITERIA**
1. Prepare assembly, layout and detail drawing	1.1. Specification requirements are determined. 1.2. Engineering calculations are undertaken to determine all dimensions including limits and fits, surface texture, datum references and geometric tolerances where appropriate to ensure functional operation and suitability. 1.3. All drawings are produced to Australian Standard 1100 or equivalent.
2. Interpret specifications and select material, components and/or	2.1. Components, material and/or assemblies are selected from data sheets or manufacturers' catalogues to meet specifications.

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ELEMENT	PERFORMANCE CRITERIA
assemblies	
3. Check drawings	3.1. Drawings are checked to ensure compliance with specifications. 3.2. Drawings are checked to ensure that assembly/fabrication is possible.

Required Skills and Knowledge

REQUIRED SKILLS AND KNOWLEDGE

This section describes the skills and knowledge required for this unit.

Required skills

Look for evidence that confirms skills in:

- obtaining all relevant work instructions and requirements
- producing all drawings in accordance with AS1100 or equivalent
- obtaining all relevant data sheets, catalogues, etc.
- checking drawings for conformance to specification
- checking drawings to ensure that assembly/fabrication is possible
- reading, interpreting and following information on written job instructions, specifications, standard operating procedures, charts, lists, drawings and other applicable reference documents
- planning and sequencing operations
- checking and clarifying task related information
- undertaking numerical operations, geometry and calculations/formulae within the scope of this unit

Required knowledge

Look for evidence that confirms knowledge of:

- specifications and/or requirements of the component, assembly or layout to be drawn
- functional operation of the component/assembly to be drawn
- surfaces which are to be in contact or separated
- appropriate type of fit for contacting surfaces
- reasons for selecting the chosen type of fit
- effect of surface finish on the performance/operation of surfaces
- appropriate datum points

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REQUIRED SKILLS AND KNOWLEDGE
• all appropriate lineal, diametric and geometric tolerances • procedures for determining tolerances • requirements of AS1100 or equivalent for the drawing(s) to be produced • specifications of the components, materials and/or assemblies • appropriate components and materials from supplier/manufacturers' catalogues • reasons for selecting the chosen components and/or materials • procedures for checking and approving drawings • reasons for checking the drawings to ensure that manufacturing/assembly is possible, efficient and cost effective • drawing specifications • methods of manufacture/assembly/fabrication from the drawing(s) • unnecessary or inappropriate tolerances • hazards and control measures associated with performing advanced engineering detail drafting, including housekeeping • safe work practices and procedures

Evidence Guide

EVIDENCE GUIDE	
The evidence guide provides advice on assessment and must be read in conjunction with the performance criteria, required skills and knowledge, range statement and the Assessment Guidelines for the Training Package.	
Overview of assessment	A person who demonstrates competency in this unit must be able to perform advanced engineering detail drafting. Competency in this unit cannot be claimed until all prerequisites have been satisfied.
Critical aspects for assessment and evidence required to demonstrate competency in this unit	Assessors must be satisfied that the candidate can competently and consistently perform all elements of the unit as specified by the criteria, including required knowledge, and be capable of applying the competency in new and different situations and contexts.
Context of and specific resources for assessment	This unit may be assessed on the job, off the job or a combination of both on and off the job. Where assessment occurs off the job, that is the candidate is not in productive work, then an appropriate simulation must be used where the range of conditions reflects realistic workplace situations. The competencies covered by this

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EVIDENCE GUIDE	
	unit would be demonstrated by an individual working alone or as part of a team. The assessment environment should not disadvantage the candidate. This unit could be assessed in conjunction with any other units addressing the safety, quality, communication, materials handling, recording and reporting associated with performing advanced engineering detail drafting or other units requiring the exercise of the skills and knowledge covered by this unit.
Method of assessment	Assessors should gather a range of evidence that is valid, sufficient, current and authentic. Evidence can be gathered through a variety of ways including direct observation, supervisor's reports, project work, samples and questioning. Questioning techniques should not require language, literacy and numeracy skills beyond those required in this unit of competency. The candidate must have access to all tools, equipment, materials and documentation required. The candidate must be permitted to refer to any relevant workplace procedures, product and manufacturing specifications, codes, standards, manuals and reference materials.
Guidance information for assessment	

Range Statement

RANGE STATEMENT	
The range statement relates to the unit of competency as a whole. It allows for different work environments and situations that may affect performance. Bold italicised wording, if used in the performance criteria, is detailed below. Essential operating conditions that may be present with training and assessment (depending on the work situation, needs of the candidate, accessibility of the item, and local industry and regional contexts) may also be included.	
Australian Standard 1100 or equivalent	Complete familiarity with AS 1100.101 or similar and its application is required in the respective field

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Unit Sector(s)

Unit sector	

Co-requisite units

Co-requisite units		

Competency field

Competency field	Drawing, drafting and design

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MEM12003B Perform precision mechanical measurement

Modification History

Editorial correction to unit application to include missing notes relating to dual band status.

Single band identifier removed to clarify dual status.

Unit Descriptor

Unit descriptor	This unit covers performing precision mechanical measurement by using precision measuring equipment, setting comparison measuring devices and maintaining precision equipment.

Application of the Unit

Application of the unit	The unit applies to precision and/or complex use of strip gauges, engineering squares, lasers, angle dekkors, sine bars, angle gauges, polygons, dividing heads, rotary tables, precision levels, micrometers, height gauges, hardness testers, and texture measuring equipment etc. Work is undertaken autonomously or as part of team environment. Work is undertaken in the field (in situ) or in a workshop/laboratory environment. This unit covers comprehensive measuring skills where judgement is required in the selection of the most appropriate techniques/devices and where results are interpreted/analysed. All specifications are obtained from engineering drawings and data sheets and/or manufacturers' instructions/data. All measurement/test procedures are undertaken to standard operating procedures or manufacturers' recommended procedures. **Band**: This unit has dual status and is to be regarded as both a Specialisation Band A unit and Specialisation Band B unit for progression to C7 (AQF level IV)

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	Unit Weight: **2**

Licensing/Regulatory Information

Not Applicable

Pre-Requisites

Prerequisite units		
Path 1	MEM12023A	Perform engineering measurements

Employability Skills Information

Employability skills	This unit contains employability skills.

Elements and Performance Criteria Pre-Content

Elements describe the essential outcomes of a unit of competency.	Performance criteria describe the performance needed to demonstrate achievement of the element. Where bold italicised text is used, further information is detailed in the required skills and knowledge section and the range statement. Assessment of performance is to be consistent with the evidence guide.

Elements and Performance Criteria

ELEMENT	PERFORMANCE CRITERIA
1. Use precision measurement equipment	1.1. Appropriate precision equipment is selected to achieve specified outcome. 1.2. Correct and appropriate measuring techniques are

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ELEMENT	PERFORMANCE CRITERIA
	used for the measurement task. 1.3. Measurements are taken accurately to the finest graduation of instrument. 1.4. Readings and measurements are interpreted correctly and accurately.
2. Set comparative measuring devices	2.1. Measuring equipment is set to specifications using manufacturer guidelines or standard operating procedures and techniques.
3. Maintain precision equipment	3.1. Measuring equipment is adjusted and maintained to required accuracy, using manufacturer or standard operating procedures and techniques. 3.2. Equipment is stored to manufacturer specifications or standard operating procedures.

Required Skills and Knowledge

REQUIRED SKILLS AND KNOWLEDGE
This section describes the skills and knowledge required for this unit.
Required skills
Look for evidence that confirms skills in: • reading and interpreting text and numerical information on manufacturer specifications, standard operating procedures, charts, lists, drawings and other applicable reference documents • selecting/using precision mechanical measuring devices • setting measuring devices to specification • obtaining specified mechanical measurements to the finest graduation of the device • measuring components to specified tolerances • reading and interpreting measurements • maintaining and adjusting precision mechanical measuring devices • storing precision mechanical measuring devices • undertaking calculations and numerical operations for measurement using precision mechanical measuring equipment
Required knowledge
Look for evidence that confirms knowledge of: • the appropriate precision mechanical measuring device for given measurement

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REQUIRED SKILLS AND KNOWLEDGE
requirements • procedures to verify equipment being used has been recently calibrated • suitability of environmental conditions for the measurements being carried out • procedures/techniques for obtaining a range of mechanical measurements • the accuracy to which a range of precision mechanical measuring devices can be read • procedures for reading graduated mechanical measuring devices • units of measurement and numerical operations within the scope of this unit • procedures for setting precision mechanical measuring devices • specifications of the equipment to be set • tools and equipment for setting mechanical measuring devices • the adjustments that can be made to a range of precision mechanical measuring devices • procedures for adjusting and maintaining precision mechanical measuring devices • procedures for storing precision mechanical measuring devices • hazards and control measures associated with precision mechanical measurement, including housekeeping • safe work practices and procedures

Evidence Guide

EVIDENCE GUIDE	
The evidence guide provides advice on assessment and must be read in conjunction with the performance criteria, required skills and knowledge, range statement and the Assessment Guidelines for the Training Package.	
Overview of assessment	A person who demonstrates competency in this unit must be able to perform precision mechanical measurement. Competency in this unit cannot be claimed until all prerequisites have been satisfied.
Critical aspects for assessment and evidence required to demonstrate competency in this unit	Assessors must be satisfied that the candidate can competently and consistently perform all elements of the unit as specified by the criteria, including required knowledge, and be capable of applying the competency in new and different situations and contexts.
Context of and specific resources for assessment	This unit may be assessed on the job, off the job or a combination of both on and off the job. Where

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EVIDENCE GUIDE	
	assessment occurs off the job, that is the candidate is not in productive work, then an appropriate simulation must be used where the range of conditions reflects realistic workplace situations. The competencies covered by this unit would be demonstrated by an individual working alone or as part of a team. The assessment environment should not disadvantage the candidate. This unit could be assessed in conjunction with other units addressing the safety, quality, communication, materials handling, recording and reporting associated with precision mechanical measurement or other units requiring the exercise of the skills and knowledge covered by this unit.
Method of assessment	Assessors should gather a range of evidence that is valid, sufficient, current and authentic. Evidence can be gathered through a variety of ways including direct observation, supervisor's reports, project work, samples and questioning. Questioning should not require language, literacy and numeracy skills beyond those required in this unit. The candidate must have access to all tools, equipment, materials and documentation required. The candidate must be permitted to refer to any relevant workplace procedures, product and manufacturing specifications, codes, standards, manuals and reference materials.
Guidance information for assessment	

Range Statement

RANGE STATEMENT	
The range statement relates to the unit of competency as a whole. It allows for different work environments and situations that may affect performance. Bold italicised wording, if used in the performance criteria, is detailed below. Essential operating conditions that may be present with training and assessment (depending on the work situation, needs of the candidate, accessibility of the item, and local industry and regional contexts) may also be included.	
Equipment	Strip gauges, engineering squares, angle dekkors,

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RANGE STATEMENT	
	sine bars, angle gauges, polygons, dividing heads, rotary tables, precision levels, micrometers, height gauges, hardness testers, and texture measuring equipment
Appropriate measuring techniques	Includes considerations of the suitability of the environmental conditions for measurements being taken
Measurements	Length, circular, straightness, flatness, hardness, angles, finishes, textures, roundness, squareness, alignment and coordinate measurement etc. on components or equipment

Unit Sector(s)

Unit sector	

Co-requisite units

Co-requisite units		

Competency field

Competency field	Measurement

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MEM12007D Mark off/out structural fabrications and shapes

Modification History

Not Applicable

Unit Descriptor

Unit descriptor	This unit of competency covers the skills required by an Engineering Tradesperson - Fabrication for transferring the dimensions from the detail drawing to work, making templates as required, developing patterns and/or transferring measurements to structures, interpreting relevant codes, standards and symbols and estimating quantities of material from drawings.

Application of the Unit

Application of the unit	The unit of competency applies to the marking off/out of general fabrications and shapes using appropriate tools and equipment. The marking out is undertaken to specified measurements, tolerances and shapes. Skills covered by this unit are generally applied in occupational and work situations associated with steel fabrication, boilermaking or sheet metal work. This unit has been developed for Engineering Tradesperson - Fabrication apprenticeship training and the recognition of trade level skills in mark off/out of structural fabrications and shapes. All work and work practices are carried out to industry, regulatory and legislative requirements. The task may be performed in the workshop or in situ. Templates and patterns are produced as required. In a marine setting, it includes basic lofting/set out for construction of marine vessels and may include items such as stem and transom development and use of tables of offsets that reflect chine and hull configuration. This may include lofting surfaces, straight edges, string lines, French curves, templates, etc. Marking out techniques may apply to a range of materials and shapes.

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	Where more extensive lofting practices are used, MEM09021B Interpret and produce curved 3-dimensional shapes should be considered. For marking out general engineering components, refer to MEM12006C Mark off/out (general engineering). **Band**: **A** **Unit Weight**: **4**

Licensing/Regulatory Information

Not Applicable

Pre-Requisites

Prerequisite units		
Path 1	MEM12023A	Perform engineering measurements

Employability Skills Information

Employability skills	This unit contains employability skills.

Elements and Performance Criteria Pre-Content

Elements describe the essential outcomes of a unit of competency.	Performance criteria describe the performance needed to demonstrate achievement of the element. Where bold italicised text is used, further information is detailed in the required skills and knowledge section and the range statement. Assessment of performance is to be consistent with the evidence guide.

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Elements and Performance Criteria

ELEMENT	PERFORMANCE CRITERIA
1. Transfer dimensions from a detail drawing to work or surface	1.1. Specifications and work requirements are determined and understood using correct and appropriate calculations 1.2. Marking out is carried out to specifications or standard operating procedures using appropriate tools and equipment 1.3. Datum points are established
2. Make templates/patterns as required	2.1. Appropriate template/pattern material is chosen when required 2.2. Required templates are produced to specifications 2.3. Correct storage procedures are followed including labelling and identification to standard operating procedures
3. Develop patterns and/or transfer measurements to structures	3.1. Most appropriate development and/or measurement sequence is chosen and applied 3.2. Allowances for fabrication and assembly are correctly determined and transferred 3.3. Measurement transfer/layout of components is checked to ensure accuracy/set out
4. Interpret relevant codes, standards and symbols	4.1. Relevant standards/codes and symbols are interpreted 4.2. Requirements of standards/codes are interpreted and applied to materials and processes
5. Estimate quantities of materials from detail drawings	5.1. Materials are correctly identified 5.2. Quantities are estimated from drawing 5.3. Material wastage is minimised

Required Skills and Knowledge

REQUIRED SKILLS AND KNOWLEDGE
This section describes the skills and knowledge required for this unit.
Required skills

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REQUIRED SKILLS AND KNOWLEDGE

Required skills include:

- reading, interpreting and following information on written job instructions, specifications, standard operating procedures, charts, lists, drawings and other applicable reference documents
- undertaking numerical operations, geometry and calculations/formulae within the scope of this unit
- planning and sequencing operations
- using techniques and equipment required for marking off/out and developing patterns
- checking for conformance to specifications
- establishing and marking datum points
- developing patterns according to specification
- determining fabrication and assembly allowances and transferring to the pattern
- where applicable, applying the requirements of the codes/standards during the geometric development/marking off/out process
- determining material and component quantities from drawings and job specifications
- minimising material wastage

Required knowledge

Required knowledge includes:

- procedures for marking off/out and pattern development
- tools and equipment to be used in the preparation of the marking off/out
- datum points
- materials that can be used for the preparation of templates and their application
- manufacturing allowances that have to be considered when developing patterns
- template labelling and identification procedures
- storage requirements of templates
- appropriate methods of development/marking off/out of a range of given objects
- appropriate fabrication and assembly allowances
- effects of material type and thickness on fabrication and assembly allowances
- sources of data on fabrication and assembly allowances
- relevant standards and codes and the meaning of symbols used
- requirements of the codes/standards applicable to the work to be done
- materials from which the component/assembly is to be manufactured
- benefits of minimising material wastage
- applicable industry standards, national/Australian Standards, NOHSC guides, state/territory regulatory codes of practice/standards
- safe work practices and procedures
- relevant hazards and control measures related to the competency

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Evidence Guide

EVIDENCE GUIDE	
The evidence guide provides advice on assessment and must be read in conjunction with the performance criteria, required skills and knowledge, range statement and the Assessment Guidelines for the Training Package.	
Overview of assessment	A person who demonstrates competency in this unit must be able to mark off/out structural fabrications and shapes. Competency in this unit cannot be claimed until all prerequisites have been satisfied.
Critical aspects for assessment and evidence required to demonstrate competency in this unit	Assessors must be satisfied that the candidate can competently and consistently apply the skills covered in this unit of competency in new and different workplace situations and contexts. Critical aspects of assessment and evidence include: • examining detailed drawings for fabrication requirements and specifications including materials, measurements and tolerances, joining methods, standards and code requirements • correctly determining sequence of measuring and/or development • correctly establishing and marking datum points • accurately transferring measurements to components • correctly calculating allowances for fabrication and assembly including shrinkage, thickness and inside/outside measurements • accurately producing templates.
Context of and specific resources for assessment	This unit has been developed to support training in and recognition of trade level competency in marking off/out structural fabrications and shapes as applied to a sheet metal or metal fabrication environment. Assessment should emphasise a workplace context and procedures found in the candidate's workplace. The competencies covered by this unit would be demonstrated by an individual working alone or as part of a team. The assessment environment should not disadvantage the candidate.

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EVIDENCE GUIDE	
Method of assessment	Typically, persons engaged in Engineering Tradesperson - Fabrication work are required to apply their geometric development skills and techniques across a range of jobs and specifications. A single assessment event is not appropriate. On the job assessment should be included as part of the assessment process wherever possible. Where assessment occurs off the job, judgement must consider evidence of the candidate's performance in a productive work environment that includes a sufficient range of appropriate tasks and materials to cover the scope of application for this unit. Assessors should gather a range of evidence that is valid, sufficient, current and authentic. Evidence can be gathered through a variety of ways including direct observation, supervisor's reports, project work, samples and questioning. Questioning techniques should not require language, literacy and numeracy skills beyond those required in this unit of competency. The candidate must have access to all tools, equipment, materials and documentation required. The candidate must be permitted to refer to any relevant workplace procedures, product and manufacturing specifications, codes, standards, manuals and reference materials.
Guidance information for assessment	This unit could be assessed in conjunction with any other units addressing the safety, quality, communication, materials handling, recording and reporting associated with marking off/out structural fabrications and shapes or other units requiring the exercise of the skills and knowledge covered by this unit. Assessors must be satisfied that the candidate can competently and consistently perform all elements of the unit as specified by the criteria, including required knowledge, and be capable of applying the competency in new and different situations and contexts.

Range Statement

RANGE STATEMENT

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RANGE STATEMENT	
The range statement relates to the unit of competency as a whole. It allows for different work environments and situations that may affect performance. Bold italicised wording, if used in the performance criteria, is detailed below. Essential operating conditions that may be present with training and assessment (depending on the work situation, needs of the candidate, accessibility of the item, and local industry and regional contexts) may also be included.	
Equipment	Equipment may include marking out tools as required
Template material	Template material may include: • steel plate • perspex • timber • cardboard • paper
Storage procedures	Storage procedures may include: • labelling • identification (e.g. template lofts)
Allowances	Allowances may include: • thickness • bend • pitch • angle • circumference • perimeter
Standards/codes and symbols	All work carried out in accordance with legislative and regulatory requirements

Unit Sector(s)

Unit sector	

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Co-requisite units

Co-requisite units		

Competency field

Competency field	Measurement

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MEM12023A Perform engineering measurements

Modification History

Not Applicable

Unit Descriptor

Unit descriptor	This unit covers performing measurement skills requiring straightforward use of mechanical measuring devices and associated calculations.

Application of the Unit

Application of the unit	This unit covers straightforward measurement using devices which incorporate visual indications representing units of measurement. It applies to the use of measuring devices in a range of manufacturing, engineering and related environments. It includes, where required, adjustment of measuring devices through simple means and typically includes zeroing or scale adjustment. Measurements may be expressed in metric or imperial units. All measurements are undertaken to standard operating procedures. Electrical/electronic devices used are those not requiring the connection or disconnection of circuitry. Work is undertaken autonomously or part of team environment, in the field, work station or workshops. For straightforward use of comparison or pre-set measuring devices, Unit MEM12001B (Use comparison and basic measuring devices) should be accessed. **Band**: **A** **Unit Weight**: **5**

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Licensing/Regulatory Information

Not Applicable

Pre-Requisites

Prerequisite units		

Employability Skills Information

Employability skills	This unit contains employability skills.

Elements and Performance Criteria Pre-Content

Elements describe the essential outcomes of a unit of competency.	Performance criteria describe the performance needed to demonstrate achievement of the element. Where bold italicised text is used, further information is detailed in the required skills and knowledge section and the range statement. Assessment of performance is to be consistent with the evidence guide.

Elements and Performance Criteria

ELEMENT	**PERFORMANCE CRITERIA**
1. Select appropriate device or equipment	1.1. Measurement requirements are determined from specifications. 1.2. Appropriate device or equipment is selected according to standard operating procedures, to achieve required outcome.
2. Obtain measurements using a range of measuring devices	2.1. Correct and appropriate measuring technique is used. 2.2. Measurements are accurately obtained .

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ELEMENT	PERFORMANCE CRITERIA
	2.3. Dimensions are determined or verified using basic calculations, where required.
3. Maintain measuring devices	3.1. Routine care and storage of devices is undertaken to manufacturers' specifications or standard operating procedures. 3.2. Routine adjustments to devices are made and checked.
4. Communicate measurements as required	4.1. Measurements are accurately recorded, where required. 4.2. Freehand sketch which depicts required information is prepared, as required.

Required Skills and Knowledge

REQUIRED SKILLS AND KNOWLEDGE

This section describes the skills and knowledge required for this unit.

Required skills

Look for evidence that confirms skills in:

- selecting the appropriate measuring device for given measuring tasks
- using appropriate measuring technique
- reading all measurements taken accurately to the finest graduation of the selected measuring device
- handling and storing measuring devices in accordance with manufacturers' specifications or standard operating procedures
- verifying all measuring devices before use
- making, where appropriate, routine adjustments to measuring devices
- reading, interpreting and following information on written job instructions, specifications, standard operating procedures, charts, lists, drawings and other applicable reference documents
- planning and sequencing operations
- checking and clarifying task related information
- checking for conformance to specifications
- undertaking numerical operations involving addition, subtraction, multiplication, division, fractions and decimals within the scope of this unit
- preparing drawings as required

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REQUIRED SKILLS AND KNOWLEDGE
Required knowledge
Look for evidence that confirms knowledge of: • correct application of a range of measuring devices • correct and appropriate measuring technique for a range of measuring devices • addition, subtraction, multiplication, division, fractions, decimals to the scope required by this unit • procedures for handling and storing a range of measuring devices • procedures for adjusting and zeroing a range of measuring devices • methods of communicating measurements by drawings, as required • safe work practices and procedures

Evidence Guide

EVIDENCE GUIDE	
The evidence guide provides advice on assessment and must be read in conjunction with the performance criteria, required skills and knowledge, range statement and the Assessment Guidelines for the Training Package.	
Overview of assessment	A person who demonstrates competency in this unit must be able to perform engineering measurements.
Critical aspects for assessment and evidence required to demonstrate competency in this unit	Assessors must be satisfied that the candidate can competently and consistently perform all elements of the unit as specified by the criteria, including required knowledge, and be capable of applying the competency in new and different situations and contexts.
Context of and specific resources for assessment	This unit may be assessed on the job, off the job or a combination of both on and off the job. Where assessment occurs off the job, that is the candidate is not in productive work, then an appropriate simulation must be used where the range of conditions reflects realistic workplace situations. The competencies covered by this unit would be demonstrated by an individual working alone or as part of a team. The assessment environment should not disadvantage the candidate. This unit could be assessed in conjunction with any other units addressing the safety, quality, communication,

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EVIDENCE GUIDE	
	materials handling, recording and reporting associated with performing engineering measurements or other units requiring the exercise of the skills and knowledge covered by this unit.
Method of assessment	Assessors should gather a range of evidence that is valid, sufficient, current and authentic. Evidence can be gathered through a variety of ways including direct observation, supervisor's reports, project work, samples and questioning. Questioning techniques should not require language, literacy and numeracy skills beyond those required in this unit of competency. The candidate must have access to all tools, equipment, materials and documentation required. The candidate must be permitted to refer to any relevant workplace procedures, product and manufacturing specifications, codes, standards, manuals and reference materials.
Guidance information for assessment	

Range Statement

RANGE STATEMENT	
The range statement relates to the unit of competency as a whole. It allows for different work environments and situations that may affect performance. Bold italicised wording, if used in the performance criteria, is detailed below. Essential operating conditions that may be present with training and assessment (depending on the work situation, needs of the candidate, accessibility of the item, and local industry and regional contexts) may also be included.	
Specifications	Drawings, sketches, job instructions, schematics, diagrams, technical manuals
Range of measuring devices	Protractors, combination squares, set squares, dial indicators, thermometers, tapes, rules, micrometers, vernier-scaled measuring equipment
Basic calculations	Calculations needed to assist in determining measurements where a reading of the graduated device is not sufficient, for example subtracting one measurement from another to give a third

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RANGE STATEMENT	
	measurement. Examples of calculations needed are addition, subtraction, multiplication, division, fractions and decimals. Calculations may be made using a calculator
Routine adjustments	Validating the device using simple zeroing or scale adjustment
Measurements	Measuring length, squareness, flatness, angle, roundness, clearances or any other measurements that can be read off analog, digital or other measuring device
Information	Dimensions, instructions, base line or datum points

Unit Sector(s)

Unit sector	

Co-requisite units

Co-requisite units		

Competency field

Competency field	Measurement

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MEM12024A Perform computations

Modification History

Not Applicable

Unit Descriptor

Unit descriptor	This unit covers estimating approximate answers to arithmetical problems, carrying out basic calculations involving percentages and proportions, and determining simple ratios and averages. The unit includes producing and interpreting simple charts and graphs.

Application of the Unit

Application of the unit	This unit applies in manufacturing, engineering or related environments. It includes the application of the four rules of algebraic expressions, extracting information from drawings, diagrams, graphs and charts and producing simple charts and graphs. Data may be derived from readings taken or may be computer generated. Applications can include computations associated with pressure, volume, temperature, heat, speed, power, elasticity, density, mass, force etc. Calculations may be performed using pen and paper or on a calculator. **Band**: **A** **Unit Weight**: **3**

Licensing/Regulatory Information

Not Applicable

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Pre-Requisites

Prerequisite units		

Employability Skills Information

Employability skills	This unit contains employability skills.

Elements and Performance Criteria Pre-Content

Elements describe the essential outcomes of a unit of competency.	Performance criteria describe the performance needed to demonstrate achievement of the element. Where bold italicised text is used, further information is detailed in the required skills and knowledge section and the range statement. Assessment of performance is to be consistent with the evidence guide.

Elements and Performance Criteria

ELEMENT	**PERFORMANCE CRITERIA**
1. Determine work requirement	1.1. Required outcomes are established from job instructions. 1.2. Data is obtained from relevant sources and interpreted correctly. 1.3. Required calculation method is determined to suit the application, including selection of relevant arithmetic operations and/or formulae. 1.4. Expected results are estimated, including rounding off, as appropriate.
2. Perform calculations	2.1. Calculation method is applied correctly. 2.2. Correct answer is obtained. 2.3. Answer is checked against estimation.

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ELEMENT	PERFORMANCE CRITERIA
3. Produce charts and graphs from given information	3.1. Data is transposed accurately to produce charts or graphs. 3.2. Charts or graphs accurately reflect data on which they are based.

Required Skills and Knowledge

REQUIRED SKILLS AND KNOWLEDGE

This section describes the skills and knowledge required for this unit.

Required skills

Look for evidence that confirms skills in:

- performing calculations involving whole numbers using all four basic rules
- performing calculations involving length, perimeter, area and volume
- checking calculated answers for accuracy
- rounding off estimated answers
- expressing information presented in fractional or decimal format as a percentage
- selecting appropriate formulae for the given application
- substituting the correct values for each term in the relevant formulae
- using appropriate mathematical operations
- performing calculations involving ratios or proportions
- determining required information from appropriate charts or graphs
- producing simple charts or graphs from given information or observations made
- selecting appropriate scales and using them in the production of charts and graphs
- marking appropriate limits clearly on the graph or chart
- reading, interpreting and following information on written job instructions, specifications, standard operating procedures, charts, lists, drawings and other applicable reference documents
- planning and sequencing operations
- checking and clarifying task related information
- checking for conformance to specifications
- undertaking numerical operations, geometry and calculations/formulae within the scope of this unit

Required knowledge

Look for evidence that confirms knowledge of:

- formula applicable to the determination of perimeter, area and volume of simple

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REQUIRED SKILLS AND KNOWLEDGE
geometric shapes • techniques for estimating approximate answers • reasons for using dimensions with the same units when calculating length, perimeter, area and volume • concepts of perimeter, area and volume • procedures for rounding off figures when estimating approximate answers • mixed numbers, decimals, fractions and whole numbers • concept of percentage • procedures to be followed in converting a decimal to a percentage • procedures for carrying out calculations involving fractions and using each of the four basic rules • procedures to be followed on converting a fraction to a percentage • sources of appropriate formulae • reasons for ensuring that the units of each term are consistent with the formulae selected • procedures for converting given units to those required for use in formulae • concepts of ratio and proportion • given ratios and proportions can be expressed in terms of whole numbers, fractions and decimal fractions • scales applicable to the axes of the graphs or charts • three types of charts and/or graphs used in the individual's field of work • where appropriate, upper and lower limits of acceptability applicable to data entered on a graph or chart • where appropriate, the trends indicated by the slope or gradient of a graph • where appropriate, the action to be taken when given trends occur or set limits are approached on graphs or charts • procedures for drawing 'lines of best fit' • the trends indicated by the graphs or charts drawn • hazards and control measures associated with performing computations, including housekeeping • safe work practices and procedures

Evidence Guide

EVIDENCE GUIDE
The evidence guide provides advice on assessment and must be read in conjunction with the performance criteria, required skills and knowledge, range statement and the Assessment Guidelines for the Training Package.

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EVIDENCE GUIDE	
Overview of assessment	A person who demonstrates competency in this unit must be able to perform computations.
Critical aspects for assessment and evidence required to demonstrate competency in this unit	Assessors must be satisfied that the candidate can competently and consistently perform all elements of the unit as specified by the criteria, including required knowledge, and be capable of applying the competency in new and different situations and contexts.
Context of and specific resources for assessment	This unit may be assessed on the job, off the job or a combination of both on and off the job. Where assessment occurs off the job, that is the candidate is not in productive work, then an appropriate simulation must be used where the range of conditions reflects realistic workplace situations. The competencies covered by this unit would be demonstrated by an individual working alone or as part of a team. The assessment environment should not disadvantage the candidate. This unit could be assessed in conjunction with any other units addressing the safety, quality, communication, materials handling, recording and reporting associated with performing computations or other units requiring the exercise of the skills and knowledge covered by this unit.
Method of assessment	Assessors should gather a range of evidence that is valid, sufficient, current and authentic. Evidence can be gathered through a variety of ways including direct observation, supervisor's reports, project work, samples and questioning. Questioning techniques should not require language, literacy and numeracy skills beyond those required in this unit of competency. The candidate must have access to all tools, equipment, materials and documentation required. The candidate must be permitted to refer to any relevant workplace procedures, product and manufacturing specifications, codes, standards, manuals and reference materials.
Guidance information for assessment	

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Range Statement

RANGE STATEMENT	
The range statement relates to the unit of competency as a whole. It allows for different work environments and situations that may affect performance. Bold italicised wording, if used in the performance criteria, is detailed below. Essential operating conditions that may be present with training and assessment (depending on the work situation, needs of the candidate, accessibility of the item, and local industry and regional contexts) may also be included.	
Relevant sources	Charts, graphs, diagrams, measurement data, reference manuals and specifications
Application	Applications can include computations associated with pressure, volume, temperature, heat, speed, power, elasticity, density, mass, force etc.
Arithmetic operations	• Application of subtraction, addition, multiplication and division • Manipulation of decimals, fractions and mixed numbers and whole numbers • Determining of percentages • Performing of algebraic expressions • Calculation of proportions and ratios
Charts and graphs	Simple histograms, control charts, pie charts etc.

Unit Sector(s)

Unit sector	

Co-requisite units

Co-requisite units		

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Competency field

Competency field	Measurement

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MEM18001C Use hand tools

Modification History

Not Applicable

Unit Descriptor

Unit descriptor	This unit covers using a range of hand tools for a variety of general engineering applications.

Application of the Unit

Application of the unit	Applications may include hand tools used for adjusting, dismantling, assembling and finishing of items or components, and the finishing, cutting, scraping of metallic and non-metallic material to size and shape. This includes simple tapping and threading and routine maintenance of hand tools. This unit should not be selected if the hand tool is dedicated to a single operation or machine and if only a machine specific/customised tool is used. When using hand held power tools or power tools used for hand held operations, refer to Unit MEM18002B (Use power tools/hand held operations). **Band**: **A** **Unit Weight**: **2**

Licensing/Regulatory Information

Not Applicable

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Pre-Requisites

Prerequisite units	

Employability Skills Information

Employability skills	This unit contains employability skills.

Elements and Performance Criteria Pre-Content

Elements describe the essential outcomes of a unit of competency.	Performance criteria describe the performance needed to demonstrate achievement of the element. Where bold italicised text is used, further information is detailed in the required skills and knowledge section and the range statement. Assessment of performance is to be consistent with the evidence guide.

Elements and Performance Criteria

ELEMENT	**PERFORMANCE CRITERIA**
1. Use hand tools	1.1. Hand tools are selected appropriate to the task requirements. 1.2. Hand tools are used to produce desired outcomes to job specifications which may include finish, tension, size or shape. 1.3. All safety requirements are adhered to before, during and after use. 1.4. Unsafe or faulty tools are identified and marked for repair according to designated procedures before, during and after use. 1.5. Routine maintenance of tools, including hand sharpening is undertaken according to standard

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ELEMENT	PERFORMANCE CRITERIA
	operational procedures, principles and techniques. 1.6. Hand tools are stored safely in appropriate location according to standard operational procedures and manufacturers' recommendations.

Required Skills and Knowledge

REQUIRED SKILLS AND KNOWLEDGE
This section describes the skills and knowledge required for this unit.
Required skills
Look for evidence that confirms skills in: • reading and following information on standard operating procedures • following verbal instructions • selecting hand tools appropriate to the task • using hand tools safely • identifying hand tool defects and marking for repair • maintaining/sharpening hand tools using appropriate techniques • storing hand tools in accordance with manufacturers'/standard operating procedures
Required knowledge
Look for evidence that confirms knowledge of: • applications of different hand tools in a general engineering context • common faults and/or defects in hand tools • procedures for marking unsafe or faulty tools for repair • routine maintenance requirements for a range of hand tools • storage location and procedures for a range of hand tools • hazards and control measures associated with using hand tools • use and application of personal protective equipment • safe work practices and procedures

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Evidence Guide

EVIDENCE GUIDE	
The evidence guide provides advice on assessment and must be read in conjunction with the performance criteria, required skills and knowledge, range statement and the Assessment Guidelines for the Training Package.	
Overview of assessment	A person who demonstrates competency in this unit must be able to use hand tools for a range of general engineering applications.
Critical aspects for assessment and evidence required to demonstrate competency in this unit	Assessors must be satisfied that the candidate can competently and consistently perform all elements of the unit as specified by the criteria, including required knowledge, and be capable of applying the competency in new and different situations and contexts.
Context of and specific resources for assessment	This unit may be assessed on the job, off the job or a combination of both on and off the job. Where assessment occurs off the job, that is the candidate is not in productive work, then an appropriate simulation must be used where the range of conditions reflects realistic workplace situations. The competencies covered by this unit would be demonstrated by an individual working alone or as part of a team. The assessment environment should not disadvantage the candidate. This unit could be assessed in conjunction with any other units addressing the safety, quality, communication, materials handling, recording and reporting associated with using hand tools or other units requiring the exercise of the skills and knowledge covered by this unit.
Method of assessment	Assessors should gather a range of evidence that is valid, sufficient, current and authentic. Evidence can be gathered through a variety of ways including direct observation, supervisor's reports, project work, samples and questioning. Questioning techniques should not require language, literacy and numeracy skills beyond those required in this unit of competency. The candidate must have access to all tools, equipment, materials and documentation required. The candidate must be permitted to refer to any relevant workplace procedures, product and manufacturing specifications, codes, standards, manuals and reference materials.
Guidance information for assessment	

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Range Statement

RANGE STATEMENT	
The range statement relates to the unit of competency as a whole. It allows for different work environments and situations that may affect performance. Bold italicised wording, if used in the performance criteria, is detailed below. Essential operating conditions that may be present with training and assessment (depending on the work situation, needs of the candidate, accessibility of the item, and local industry and regional contexts) may also be included.	
Hand tools	Hacksaws, hammers, punches, screwdrivers, sockets, wrenches, scrapers, chisels, gouges, wood planes and files of all cross-sectional shapes and types
Job specifications	Finish, tension, size or shape etc.
Routine maintenance	Cleaning, lubricating, tightening, simple tool repairs, hand sharpening and adjustments using engineering principles, tools, equipment and procedures

Unit Sector(s)

Unit sector	

Co-requisite units

Co-requisite units		

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Competency field

Competency field	Maintenance and diagnostics

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MEM18002B Use power tools/hand held operations

Modification History

Not Applicable

Unit Descriptor

Unit descriptor	This unit covers using a range of hand held power tools and fixed power tools for hand held operations for a variety of general engineering applications.

Application of the Unit

Application of the unit	This unit applies to loosening and fastening items or components and shaping, finishing, cutting, grinding metallic and non-metallic materials and/or tool bits to size and shape. This unit should not be selected if the power tools used are dedicated to an operation or machine, e.g. nut-runner, air drill, power driver, etc. For using hand tools, see Unit MEM18001C (Use hand tools). **Band**: **A** **Unit Weight**: **2**

Licensing/Regulatory Information

Not Applicable

Pre-Requisites

Prerequisite units	

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Prerequisite units	

Employability Skills Information

Employability skills	This unit contains employability skills.

Elements and Performance Criteria Pre-Content

Elements describe the essential outcomes of a unit of competency.	Performance criteria describe the performance needed to demonstrate achievement of the element. Where bold italicised text is used, further information is detailed in the required skills and knowledge section and the range statement. Assessment of performance is to be consistent with the evidence guide.

Elements and Performance Criteria

ELEMENT	**PERFORMANCE CRITERIA**
1. Use power tools	1.1. Power tools are selected appropriate to the task requirements. 1.2. Power tools are used for a determined sequence of operations - which may include clamping, alignment and adjustment to produce desired outcomes - to job specifications which may include finish, size or shape. 1.3. All safety requirements are adhered to before, during and after use. 1.4. Unsafe or faulty tools are identified and marked for repair before, during and after use according to designated procedures. 1.5. Operational maintenance of tools, including hand sharpening, is undertaken according to standard

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ELEMENT	PERFORMANCE CRITERIA
	workplace procedures, principles and techniques. 1.6. Power tools are stored safely in appropriate location according to standard workshop procedures and manufacturers' recommendations.

Required Skills and Knowledge

REQUIRED SKILLS AND KNOWLEDGE
This section describes the skills and knowledge required for this unit.
Required skills
Look for evidence that confirms skills in: • reading and following information on standard operating procedures • following verbal instructions • selecting power tools appropriate to the task • using power tools safely • using clamping/securing devices • identifying power tool defects • maintaining power tools using appropriate techniques • sharpening tools/tool bits within the scope of this unit • storing power tools according to manufacturers'/ standard operating procedures.
Required knowledge
Look for evidence that confirms knowledge of: • application of different power tools • clamping/securing methods • adjustments/alignments to a range of power tools • common faults and/or defects in power tools • procedures for marking unsafe or faulty power tools for repair • routine maintenance requirements of a range of power tools • tool sharpening techniques for a range of power tools • storage location and procedures of a range of power tools • hazards/control measures associated with power tools • use and application of personal protective equipment • safe work practices and procedures

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Evidence Guide

EVIDENCE GUIDE	
The evidence guide provides advice on assessment and must be read in conjunction with the performance criteria, required skills and knowledge, range statement and the Assessment Guidelines for the Training Package.	
Overview of assessment	A person who demonstrates competency in this unit must be able to use power tools/hand held operations.
Critical aspects for assessment and evidence required to demonstrate competency in this unit	Assessors must be satisfied that the candidate can competently and consistently perform all elements of the unit as specified by the criteria, including required knowledge, and be capable of applying the competency in new and different situations and contexts.
Context of and specific resources for assessment	This unit may be assessed on the job, off the job or a combination of both on and off the job. Where assessment occurs off the job, that is the candidate is not in productive work, then an appropriate simulation must be used where the range of conditions reflects realistic workplace situations. The competencies covered by this unit would be demonstrated by an individual working alone or as part of a team. The assessment environment should not disadvantage the candidate. This unit could be assessed in conjunction with any other units addressing the safety, quality, communication, materials handling, recording and reporting associated with using power tools/hand held operations or other units requiring the exercise of the skills and knowledge covered by this unit.
Method of assessment	Assessors should gather a range of evidence that is valid, sufficient, current and authentic. Evidence can be gathered through a variety of ways including direct observation, supervisor's reports, project work, samples and questioning. Questioning should not require language, literacy and numeracy skills beyond those required in this unit. The candidate must have access to all tools, equipment, materials and documentation required. The candidate must be permitted to refer to any relevant workplace procedures, product and manufacturing specifications, codes, standards, manuals and reference materials.

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EVIDENCE GUIDE	
Guidance information for assessment	

Range Statement

RANGE STATEMENT	
The range statement relates to the unit of competency as a whole. It allows for different work environments and situations that may affect performance. Bold italicised wording, if used in the performance criteria, is detailed below. Essential operating conditions that may be present with training and assessment (depending on the work situation, needs of the candidate, accessibility of the item, and local industry and regional contexts) may also be included.	
Power tools	Electric or pneumatic/hydraulic drills, grinders, jigsaws, nibblers, cutting saws, sanders, planers, routers, pedestal drills and pedestal grinders
Clamping	Multigrips, vices, jigs and fixtures, clamps etc.
Job specifications	Finish, size or shape etc.
Operational maintenance	Hand sharpening, cleaning, lubricating, tightening Simple tool repairs and adjustments using engineering principles, tools, equipment and procedures to statutory and regulatory requirements

Unit Sector(s)

Unit sector	

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Co-requisite units

Co-requisite units		

Competency field

Competency field	Maintenance and diagnostics

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MEM18003C Use tools for precision work

Modification History

Not Applicable

Unit Descriptor

Unit descriptor	This unit covers using tools to manually produce work to precise dimensions and or finishes.

Application of the Unit

Application of the unit	Work is undertaken autonomously or in a team environment, using predetermined standards of quality, safety and workshop procedures. This unit involves using a variety of tools, instruments and power equipment to perform precision tasks on a range of metallic and non-metallic materials. As a guide, the types of precision work covered by this unit could include: • scraping machine beds to precise tolerances • broaching a tapered keyway • hand reaming the bore of a spigot or bush to a positive transition fit with shaft • core drilling (finishing) a blind locating hole to receive a mating pin • lapping a mechanical seal to fine finish • filing complex angles and mating edges • precision grinding using flex-drive attachment or similar Inspection and preventative maintenance of tools and equipment involves the visual checking of leads and connections, sharpening of cutting equipment and the repair of associated tools. Where precision measurement is required, Unit MEM12003B (Perform precision mechanical measurement) should also be selected. Where precision marking out is required, Unit

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	MEM12006C (Mark off/out [general engineering]) should also be selected. Where specifications are interpreted from engineering drawings, detailed/technical sketches and associated documents, Unit MEM09002B (Interpret technical drawing) should also be selected. **Band**: **A** **Unit Weight**: **4**

Licensing/Regulatory Information

Not Applicable

Pre-Requisites

Prerequisite units		
Path 1	MEM12023A	Perform engineering measurements
	MEM18001C	Use hand tools
	MEM18002B	Use power tools/hand held operations

Employability Skills Information

Employability skills	This unit contains employability skills.

Elements and Performance Criteria Pre-Content

Elements describe the essential outcomes of a unit of competency.	Performance criteria describe the performance needed to demonstrate achievement of the element. Where bold italicised text is used, further information is detailed in the required skills and knowledge section and the range

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	statement. Assessment of performance is to be consistent with the evidence guide.

Elements and Performance Criteria

ELEMENT	PERFORMANCE CRITERIA
1. Determine job requirements	1.1. Task requirements and specifications are determined and clarified with appropriate persons. 1.2. Processes/techniques are selected appropriate to task, specifications and material.
2. Prepare tools and tooling to produce precision outcome	2.1. Tools, accessories and consumables are selected appropriate to task, specifications and material. 2.2. Where applicable, cutting tool modifications required to produce outcome are determined using engineering principles. 2.3. Tools/tooling are prepared and modified as required.
3. Use tools to produce work to precise specifications	3.1. The work area is prepared and made safe. 3.2. The work piece is prepared and secured using appropriate method for selected operation/s. 3.3. Tools are used according to acceptable engineering principles, methods, applications and procedures to produce specified outcome to the required accuracy. 3.4. Tools and equipment are inspected for safe and proper working order before, during and after use. 3.5. Unserviceable tools/equipment are identified, repaired where appropriate, or marked for repair and/or disposal, according to prescribed procedure. 3.6. Tools are stored and maintained to ensure serviceability.

Required Skills and Knowledge

REQUIRED SKILLS AND KNOWLEDGE
This section describes the skills and knowledge required for this unit.
Required skills

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REQUIRED SKILLS AND KNOWLEDGE

Look for evidence that confirms skills in:

- obtaining and interpreting relevant drawings, specifications, instructions etc.
- preparing and making safe the work area(s) prior to the work being carried out
- using appropriate tools to produce the specified outcomes
- checking tools and equipment for safe and proper working order before, during and after use
- where appropriate, marking unsafe or faulty tools and equipment for repair
- where appropriate, repairing/maintaining unsafe or faulty tools
- checking condition of all tools and equipment for conformance to specifications and safe and proper operation prior to storage
- safely storing all tools and equipment in the appropriate location

Required knowledge

Look for evidence that confirms knowledge of:

- work to be undertaken
- specifications to be achieved
- appropriate tools, processes and equipment required to carry out the work to the required specifications
- reasons for selecting the chosen tools, processes and equipment
- hazards and control measures associated with using the selected tools, processes and equipment, including housekeeping
- safety procedures to be followed to ensure the safety of the individual and other personnel
- procedures for using the selected tools
- engineering principles to be applied during the use of the tools
- manufacturers' specifications of the tools and equipment selected
- safe and proper function of tools and equipment selected
- procedures for checking tools and equipment for correct and safe operation
- common faults and/or defects in tools and equipment used/selected
- procedures for marking unsafe or faulty tools and equipment for repair
- repairs/operational maintenance that can be made to the tools and equipment used/selected
- procedures for repairing/maintaining the tools and equipment used/selected
- procedures for checking tools and equipment prior to storage
- storage location of the tools and equipment used/selected
- procedures for storing tools and equipment used/selected

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Evidence Guide

EVIDENCE GUIDE	
The evidence guide provides advice on assessment and must be read in conjunction with the performance criteria, required skills and knowledge, range statement and the Assessment Guidelines for the Training Package.	
Overview of assessment	A person who demonstrates competency in this unit must be able to use tools to fashion or shape work to high levels of precision for dimension and or finish to specifications. Competency in this unit cannot be claimed until all prerequisites have been satisfied.
Critical aspects for assessment and evidence required to demonstrate competency in this unit	Assessors must be satisfied that the candidate can competently and consistently perform all elements of the unit as specified by the criteria, including required knowledge, and be capable of applying the competency in new and different situations and contexts.
Context of and specific resources for assessment	This unit may be assessed on the job, off the job or a combination of both on and off the job. Where assessment occurs off the job, that is the candidate is not in productive work, then an appropriate simulation must be used where the range of conditions reflects realistic workplace situations. The competencies covered by this unit would be demonstrated by an individual working alone or as part of a team. The assessment environment should not disadvantage the candidate. This unit could be assessed in conjunction with any other units addressing the safety, quality, communication, materials handling, recording and reporting associated with using tools for precision work or other units requiring the exercise of the skills and knowledge covered by this unit.
Method of assessment	Assessors should gather a range of evidence that is valid, sufficient, current and authentic. Evidence can be gathered through a variety of ways including direct observation, supervisor's reports, project work, samples and questioning. Questioning techniques should not require language, literacy and numeracy skills beyond those required in this unit of competency. The candidate must have access to all tools, equipment, materials and documentation required. The candidate must be permitted to refer to any relevant workplace procedures, product and manufacturing specifications, codes, standards, manuals and reference materials.

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EVIDENCE GUIDE	
Guidance information for assessment	

Range Statement

RANGE STATEMENT	
The range statement relates to the unit of competency as a whole. It allows for different work environments and situations that may affect performance. Bold italicised wording, if used in the performance criteria, is detailed below. Essential operating conditions that may be present with training and assessment (depending on the work situation, needs of the candidate, accessibility of the item, and local industry and regional contexts) may also be included.	
Processes	• Hand tools and hand held power tools are used to fashion or shape work to high levels of precision for dimension and or finish to specifications • Engineering techniques, methods and procedures may include cutting out, drilling, fitting, filing, reaming, lapping, broaching, burnishing, scraping, polishing, hand held grinding, chiselling
Precision outcomes	Specified tolerances, allowances, fits, finishes, alignments
Tools	Any tools or equipment required to achieve precision outcomes
Tool modifications	Tool shape, rake angle and clearance angles

Unit Sector(s)

Unit sector	

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Co-requisite units

Co-requisite units		

Competency field

Competency field	Maintenance and diagnostics

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MEM18006C Repair and fit engineering components

Modification History

Not Applicable

Unit Descriptor

Unit descriptor	This unit of competency covers mechanical repair and fitting trade skills including fault finding, repair of faulty components, manufacturing of new parts/components, and fitting mechanical engineering components into assemblies or sub-assemblies to specified measurements and tolerances and consistency with manufacturer's specification. Repair and fitting of engineering components is undertaken using mechanical engineering and maintenance principles, designated procedures, correct and appropriate tools/equipment, and safe working practices.

Application of the Unit

Application of the unit	This unit of competency applies to repair and fitting work undertaken by a tradesperson in a mechanical maintenance, service or workshop environment. Work is undertaken autonomously or as part of a team using predetermined standards of quality, safety and workshop procedures. Skills covered include determining the need for repair or replacement of parts and assemblies, and undertaking of repair, replacement, assembly and final fitting of items, sub-assemblies and assemblies. All specifications are interpreted from engineering drawings, detailed/technical sketches and associated data sheets. The unit includes the use of appropriate workshop practices. New components are manufactured as required to specifications. This unit has been developed for Engineering Tradesperson - Mechanical apprenticeship training and the recognition of trade level skills in repair and fitting of engineering components. Skills covered by this unit are generally applied in occupational and work situations

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	associated with trade level fitting and machining work. It may also apply to other mechanical trade occupational areas requiring high level repair and fit of engineering component skills. This unit has application in the MEM30205 Certificate III in Engineering - Mechanical qualification and other qualifications requiring a trade level of repair and fit skills. This unit does not address machining competencies and welding, if these are required, the appropriate units should also be accessed. Where additional or higher marking out skills are required, refer to MEM12006C Mark off/out (general engineering). The knowledge and skills associated with the installation, removal, repair or replacement of mechanical seals is covered by MEM18012B Perform installation and removal of mechanical seals. For high pressure fluid power seals, refer to MEM18020B Maintain hydraulic system components. **Band**: **A** **Unit Weight**: **6**

Licensing/Regulatory Information

Not Applicable

Pre-Requisites

Prerequisite units		
Path 1	MEM09002B	Interpret technical drawing
	MEM12023A	Perform engineering measurements
	MEM18001C	Use hand tools
	MEM18002B	Use power tools/hand held operations
	MEM18003C	Use tools for precision work

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Prerequisite units		
	MEM18055B	Dismantle, replace and assemble engineering components

Employability Skills Information

Employability skills	This unit contains employability skills.

Elements and Performance Criteria Pre-Content

Elements describe the essential outcomes of a unit of competency.	Performance criteria describe the performance needed to demonstrate achievement of the element. Where bold italicised text is used, further information is detailed in the required skills and knowledge section and the range statement. Assessment of performance is to be consistent with the evidence guide.

Elements and Performance Criteria

ELEMENT	**PERFORMANCE CRITERIA**
1. Identify scope of repair and/or fit required	1.1. Operational specifications for components are obtained from appropriate source and are interpreted and understood 1.2. Operation and condition of components are assessed against specifications 1.3. Faulty/worn components are identified 1.4. Causes of faults are determined using appropriate engineering principles, techniques, procedures, tools and equipment 1.5. Repair, replacement, adjustment or manufacture requirements are determined
2. Repair/replace faulty components	2.1. Where applicable, appropriate method of repair is determined 2.2. Where applicable, faulty components are repaired or

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ELEMENT	PERFORMANCE CRITERIA
	adjusted to conform to specifications 2.3. Where applicable, replacement parts are selected from manufacturers' catalogues and assessed against specifications
3. Manufacture parts/components	3.1. Parts/component specifications are determined from appropriate source 3.2. Materials are selected to meet specification requirements 3.3. New components are produced in conformance to specifications using appropriate workshop practices 3.4. Completed components are inspected for compliance with dimensions 3.5. Where appropriate, component parts are marked for identification prior to assembly
4. Fit engineering components into assemblies or sub-assemblies	4.1. Fitting requirements and sequence of assembly are determined 4.2. Appropriate fitting principles and techniques are applied in the preparation and assembly of component parts using fastening equipment and methods which ensures conformance to specifications, operational performance, quality and safety 4.3. Using acceptable engineering practices, correct gland packing, jointing/gasket materials are selected and applied correctly in conformance to specifications and operational requirements 4.4. Correct lubrication requirements are determined by appropriate means and attended to where applicable 4.5. Final adjustments are performed on component assembly to meet operational specifications using acceptable engineering principles, fitting techniques and procedures
5. Check operation of repaired components/unit	5.1. Components/unit are checked under operational conditions for compliance to operational specifications using acceptable engineering principles to standard operating procedures 5.2. Out of specification modification/alterations are approved by appropriate authority and are recorded and documented to standard operating procedures 5.3. Final component assembly is commissioned and returned to service according to standard operating procedures

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Required Skills and Knowledge

REQUIRED SKILLS AND KNOWLEDGE

This section describes the skills and knowledge required for this unit.

Required skills

Required skills include:

- obtaining operational specifications for the components
- assessing operation against specification and identifying faults
- checking components visually and dimensionally against the operational specifications using work site procedures
- checking repaired components visually and dimensionally for conformance to specifications
- adjusting components to achieve conformance to specifications where appropriate
- selecting replacement parts which conform to specifications
- preparing and assembling components using appropriate fitting techniques and principles
- where appropriate, applying gland packing, jointing or gasket materials, using acceptable engineering practices
- applying appropriate lubricants to the assembly using acceptable engineering practices, where required
- checking components for conformance to specification
- where required, adjusting components to achieve conformance to specifications
- where required, recording any approved modifications/alterations to work site procedures
- inspecting the final assembly and checking conformance to operational specifications
- where appropriate, returning the final assembly to service in accordance with work site procedures
- reading, interpreting and following information on written job instructions, specifications, standard operating procedures, charts, lists, drawings and other applicable reference documents
- undertaking numerical operations, geometry and calculations/formulae within the scope of this unit

Required knowledge

Required knowledge includes:

- tools and equipment to be used to dismantle the components
- consequences of having components that do not comply with operational

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REQUIRED SKILLS AND KNOWLEDGE
specifications • types of adjustment applicable to the components being repaired/fitted • appropriate methods of repair • features and/or dimensions upon which replacement parts are to be selected • process of identifying replacement parts from third party suppliers' catalogues • material properties required • manufacturing operations to be used in the production of new components • sequence of operations to be used in the production of new components • fitting requirements for assembling components • appropriate sequence of assembly tasks • purpose of using gland packing, jointing or gasket materials • reasons for selecting particular jointing or packing materials • applications of different types of lubricants • consequences of using inappropriate or no lubricant • the need to have approval for out of specification modifications • reasons for documenting out of specification modifications • return to service procedures • consequences of not following work site return to service procedures • hazard and control measures associated with repairing and fitting engineering components, including housekeeping • safe work practices and procedures

Evidence Guide

EVIDENCE GUIDE	
The evidence guide provides advice on assessment and must be read in conjunction with the performance criteria, required skills and knowledge, range statement and the Assessment Guidelines for the Training Package.	
Overview of assessment	A person who demonstrates competency in this unit must be able to repair and fit engineering components to specifications in both workshop and site environments. Competency in this unit cannot be claimed until all prerequisites have been satisfied.
Critical aspects for assessment and evidence required to demonstrate competency in this unit	Assessors must be satisfied that the candidate can competently and consistently apply the skills covered in this unit of competency in new and different situations and contexts. Critical aspects of assessment and evidence

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EVIDENCE GUIDE	
	include: • obtaining manufacturer's and enterprise specifications for equipment, materials and components • checking components visually and dimensionally in the workplace including tolerances, allowances, clearances and limits • repairing and fitting components and assemblies in a workshop environment to required specifications • repairing and fitting components and assemblies in a production or other work site environment • manufacturing and fitting components including commissioning and return to service checking of component and equipment through first off production or other recognised return to service checking procedure • procedures for out of specification modification/alterations.
Context of and specific resources for assessment	This unit has been developed to support training in and recognition of trade level competency repair and fit of engineering components as applied to a trade level fitting and machining work environment. Assessment should emphasise a workplace context and procedures found in the candidate's workplace. The competencies covered by this unit would be demonstrated by an individual working alone or as part of a team. The assessment environment should not disadvantage the candidate.
Method of assessment	Typically, persons engaged in Engineering Tradesperson - Mechanical work are required to apply their repair and fit skills and techniques across a range of jobs and specifications. A single assessment event is not appropriate. On the job assessment should be included as part of the assessment process wherever possible. Where assessment occurs off the job, judgement must consider evidence of the candidate's performance in a productive work environment that includes a sufficient range of appropriate tasks and materials to cover the scope of application for this unit. Assessors should gather a range of evidence that is valid, sufficient, current and authentic. Evidence can be gathered through a variety of ways including direct

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EVIDENCE GUIDE	
	observation, supervisor's reports, project work, samples and questioning. Questioning techniques should not require language, literacy and numeracy skills beyond those required in this unit of competency. The candidate must have access to all tools, equipment, materials and documentation required. The candidate must be permitted to refer to any relevant workplace procedures, product and manufacturing specifications, codes, standards, manuals and reference materials
Guidance information for assessment	This unit could be assessed in conjunction with any other units addressing the safety, quality, communication, materials handling, recording and reporting associated with repair and fit of engineering components or other units requiring the exercise of the skills and knowledge covered by this unit. Assessors must be satisfied that the candidate can competently and consistently perform all elements of the unit as specified by the criteria, including required knowledge, and be capable of applying the competency in new and different situations and contexts.

Range Statement

RANGE STATEMENT	
The range statement relates to the unit of competency as a whole. It allows for different work environments and situations that may affect performance. Bold italicised wording, if used in the performance criteria, is detailed below. Essential operating conditions that may be present with training and assessment (depending on the work situation, needs of the candidate, accessibility of the item, and local industry and regional contexts) may also be included.	
Manufacturers' catalogues	Manufacturers' catalogues may include any appropriate manufacturers' catalogues that contain replacement parts that conform with specifications and operational requirements
Appropriate workshop practices	Appropriate workshop practices may include: • drilling • scraping

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RANGE STATEMENT	
	• filing • reaming • tapping • threading
Fitting principles and techniques	Fitting principles and techniques may include: • limits of tolerance • allowances and clearances • effects of wear, stress, temperature • types of fits - clearance transition interference • press fitting methods • force fits • shrink and freeze (expansion) fits • keyed fits • taper fits • lateral and radial forces • backlash • configuration and mating of parts • applied use of precision tools and measuring equipment • engineering components - shafts, single and multi-throw crankshafts, cams and journals, bearings and bearing surfaces, keys • squareness, roundness, concentricity, flatness, straightness, surface finish and angular correctness • datum and centrelines • tapping, reaming and broaching

Unit Sector(s)

Unit sector	

Co-requisite units

Co-requisite units	

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Co-requisite units		

Competency field

Competency field	Maintenance and diagnostics

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MEM18007B Maintain and repair mechanical drives and mechanical transmission assemblies

Modification History

Not Applicable

Unit Descriptor

Unit descriptor	This unit covers diagnosing faults and repairing drives and transmission assemblies, and undertaking final adjustment and commissioning.

Application of the Unit

Application of the unit	This unit applies to diagnostics and maintenance, repair, adjustment and commissioning of mechanical drives and mechanical transmission assemblies. This unit should not be selected where either Unit MEM18042C (Diagnose and rectify manual transmissions), or Unit MEM18043C (Diagnose and rectify automatic transmissions) or Unit MEM18044C (Diagnose and rectify drive line and final drives) are also selected. **Band**: **A** **Unit Weight**: **4**

Licensing/Regulatory Information

Not Applicable

Pre-Requisites

Prerequisite units	

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Prerequisite units		
Path 1	MEM09002B	Interpret technical drawing
	MEM12023A	Perform engineering measurements
	MEM18001C	Use hand tools
	MEM18002B	Use power tools/hand held operations
	MEM18003C	Use tools for precision work
	MEM18006C	Repair and fit engineering components
	MEM18009B	Perform levelling and alignment of machines and engineering components
	MEM18055B	Dismantle, replace and assemble engineering components

Employability Skills Information

Employability skills	This unit contains employability skills.

Elements and Performance Criteria Pre-Content

Elements describe the essential outcomes of a unit of competency.	Performance criteria describe the performance needed to demonstrate achievement of the element. Where bold italicised text is used, further information is detailed in the required skills and knowledge section and the range statement. Assessment of performance is to be consistent with the evidence guide.

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Elements and Performance Criteria

ELEMENT	PERFORMANCE CRITERIA
1. Undertake maintenance checks of mechanical drives and mechanical transmission components	1.1. Principles of mechanical drives and mechanical transmission components are understood. 1.2. The function of the main parts of the designated mechanical drive/transmission assembly is understood. 1.3. Appropriate maintenance principles, techniques, tools and equipment, mechanical drive/transmission components are used to check for wear, distortion, tensions, misalignment, fatigue, lubrication, slackness, tooth wear, breakages and other related malfunctions. 1.4. Assembly requiring further diagnosis, repair or adjustment is identified and findings are documented.
2. Adjust mechanical drives and transmission assemblies	2.1. Adjustment requirements are determined. 2.2. A suitable adjustment method is determined from manufacturers' instruction sheets, standard workshop manuals/procedures or other means. 2.3. Adjustment tools and equipment are selected according to the type of assembly being serviced. 2.4. Appropriate maintenance principles, techniques, tools and equipment are used, and drives/transmission components are tensioned, aligned balanced or adjusted to manufacturers'/site specifications according to safe workshop practices. 2.5. Drive/transmission assembly is checked after adjustment for correct operation or identified for further diagnosis or repair. 2.6. Service report is completed. 2.7. Further diagnosis or repair requirements are actioned.
3. Diagnose faults	3.1. Service reports are read and visual and sensory inspection of the drive/transmission assembly is undertaken. 3.2. Given manufacturers' specifications, and where applicable, diagnostic equipment drive/transmission assembly is tested using sound maintenance principles and procedures. 3.3. Faults are localised at the component level and identified for repair or replacement. 3.4. Fault causes are analysed and preventative measures

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ELEMENT	PERFORMANCE CRITERIA
	to avoid re-occurrence are developed, documented and actioned by appropriate means. 3.5. Requirements for repair or replacement are actioned.
4. Repair mechanical drives/transmission assemblies	4.1. Service reports are read and visual and sensory inspection of the drive/transmission assembly is undertaken. 4.2. Task requirements are ascertained. 4.3. Tools and equipment are selected according to the type of assembly being serviced. 4.4. Mechanical drive/transmission assembly is dismantled using appropriate maintenance principles, techniques, tools, equipment and safe workshop practices. 4.5. Serviceable items are repaired using appropriate maintenance procedures according to manufacturers' specifications and standard workshop practices. 4.6. Standard replaceable items are selected and obtained using manufacturers' catalogues, spare parts lists, engineering specifications. 4.7. Component parts are refitted to mechanical drive/transmission assembly using sound maintenance principles, techniques, tools and equipment in accordance with manufacturers'/site specifications.
5. Final adjustment and commissioning	5.1. Using applicable maintenance principles and procedures, drive/transmission components are tensioned, balanced, aligned or adjusted to suit specifications and operational requirements. 5.2. Drive/transmission assembly is checked after adjustment and operational performance is analysed. 5.3. Assembly is commissioned to specifications. 5.4. Service report is completed.

Required Skills and Knowledge

REQUIRED SKILLS AND KNOWLEDGE
This section describes the skills and knowledge required for this unit.

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REQUIRED SKILLS AND KNOWLEDGE

Required skills

Look for evidence that confirms skills in:

- locating, reading and interpreting information on written job instructions, specifications, manufacturers' instructions, standard workshop manuals/procedures, drawings, charts, lists and other reference documentation
- checking and clarifying task-related information
- interpreting manufacturers' catalogues or engineering specifications
- undertaking diagnostic and testing
- analysing operational performance
- planning and sequencing operations
- completing proformas, standard workplace forms and short reports using relevant terminology
- checking for conformance to specifications
- measuring components to specified tolerances
- undertaking calculations for determining cutting parameters and checking tolerances
- undertaking numerical operations and engineering calculations/formulae within the scope of this unit
- following verbal instructions
- orally reporting information

Required knowledge

Look for evidence that confirms knowledge of:

- uses and characteristics of lubricants
- principles of operation of a range of mechanical drives and transmissions
- techniques, tools and equipment to measure components
- common malfunctions in mechanical drives, transmissions and their components
- procedures for checking and adjusting mechanical drives, transmissions and their components
- preventative measures that can be undertaken to avoid recurrence of the fault/failure
- any applicable industry standards, national/Australian standards, NOHSC guidelines, State/Territory regulatory codes of practice/standards
- use and application of personal protective equipment
- safe work practices and procedures
- hazards and control measures associated with maintaining and repairing mechanical drives and mechanical transmission assemblies

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Evidence Guide

EVIDENCE GUIDE	
The evidence guide provides advice on assessment and must be read in conjunction with the performance criteria, required skills and knowledge, range statement and the Assessment Guidelines for the Training Package.	
Overview of assessment	A person who demonstrates competency in this unit must be able to diagnose faults and repair drives and transmission assemblies and undertake final adjustment and commissioning. Competency in this unit cannot be claimed until all prerequisites have been satisfied.
Critical aspects for assessment and evidence required to demonstrate competency in this unit	Assessors must be satisfied that the candidate can competently and consistently perform all elements of the unit as specified by the criteria, including required knowledge, and be capable of applying the competency in new and different situations and contexts.
Context of and specific resources for assessment	This unit may be assessed on the job, off the job or a combination of both on and off the job. Where assessment occurs off the job, that is the candidate is not in productive work, then an appropriate simulation must be used where the range of conditions reflects realistic workplace situations. The competencies covered by this unit would be demonstrated by an individual working alone or as part of a team. The assessment environment should not disadvantage the candidate. This unit could be assessed in conjunction with any other units addressing the safety, quality, communication, materials handling, recording and reporting associated with maintaining/repairing mechanical drives and mechanical transmission assemblies or other units requiring the exercise of the skills and knowledge covered by this unit.
Method of assessment	Assessors should gather a range of evidence that is valid, sufficient, current and authentic. Evidence can be gathered through a variety of ways including direct observation, supervisor's reports, project work, samples and questioning. Questioning techniques should not require language, literacy and numeracy skills beyond those required in this unit of competency. The candidate must have access to all tools, equipment, materials and documentation required. The candidate must be permitted to refer to any relevant workplace procedures, product and manufacturing specifications, codes,

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EVIDENCE GUIDE	
	standards, manuals and reference materials.
Guidance information for assessment	

Range Statement

RANGE STATEMENT	
The range statement relates to the unit of competency as a whole. It allows for different work environments and situations that may affect performance. Bold italicised wording, if used in the performance criteria, is detailed below. Essential operating conditions that may be present with training and assessment (depending on the work situation, needs of the candidate, accessibility of the item, and local industry and regional contexts) may also be included.	
Mechanical drive/transmission	Worm and worm wheel, line shafts, plumber blocks, pulleys, sprockets, belts, taper bush assemblies, roller chains, chain drives, mechanical and hydraulic couplings, compression couplings, disc type flexible couplings, spider type, chain couplings, universal joints, bevel gearing, rack and pinion gearing, dog toothed clutches, cone type clutches, expanding shoe type clutches, friction/plate type clutches, centrifugal clutches, toggle action linkages, magnetic clutches, sprag clutches, band type brakes and other associated drive components.
Service reports	According to workplace procedures
Sensory inspection	Vibration, heat, smell, sound, sight
Commissioned	Confirming readiness for use or return to service

Unit Sector(s)

Unit sector	

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Co-requisite units

Co-requisite units		

Competency field

Competency field	Maintenance and diagnostics

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MEM18009B Perform levelling and alignment of machines and engineering components

Modification History

Not Applicable

Unit Descriptor

Unit descriptor	This unit covers undertaking levelling and alignment measurements/readings and performing levelling and/or alignment tasks.

Application of the Unit

Application of the unit	This unit applies to the setting up and use of alignment measuring devices and precision levelling devices. All adjustments are performed according to designated procedures in conformance to specifications. The application of appropriate engineering principles, techniques, tools and equipment is integral to all tasks relating to the levelling of equipment and the alignment of component parts. **Band**: **A** **Unit Weight**: **4**

Licensing/Regulatory Information

Not Applicable

Pre-Requisites

Prerequisite units		
Path 1	MEM09002B	Interpret technical drawing

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Prerequisite units		
	MEM12023A	Perform engineering measurements
	MEM18001C	Use hand tools
	MEM18002B	Use power tools/hand held operations
	MEM18003C	Use tools for precision work
	MEM18006C	Repair and fit engineering components
	MEM18055B	Dismantle, replace and assemble engineering components

Employability Skills Information

Employability skills	This unit contains employability skills.

Elements and Performance Criteria Pre-Content

Elements describe the essential outcomes of a unit of competency.	Performance criteria describe the performance needed to demonstrate achievement of the element. Where bold italicised text is used, further information is detailed in the required skills and knowledge section and the range statement. Assessment of performance is to be consistent with the evidence guide.

Elements and Performance Criteria

ELEMENT	**PERFORMANCE CRITERIA**
1. Undertake levelling and alignment measurements/readings	1.1. Principles of levelling and alignment are understood and utilised. 1.2. Task requirements are determined by inspection of equipment to be levelled and/or components to be

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ELEMENT	PERFORMANCE CRITERIA
	aligned. 1.3. The correct appropriate levelling and/or alignment procedure is selected. 1.4. Correct and appropriate levelling or alignment devices/equipment are selected and set up to standard operating procedures or manufacturers' recommendation. 1.5. Measurements/readings are taken accurately and recorded correctly to standard operating procedures.
2. Perform levelling and/or alignment tasks	2.1. Correct and appropriate engineering principles, techniques, tools and equipment are selected. 2.2. Levelling realignment calculations are performed using correct and appropriate method for levelling/alignment application. 2.3. Equipment is levelled to specifications using correct and appropriate techniques 2.4. Levelling and alignment task is completed to specifications.

Required Skills and Knowledge

REQUIRED SKILLS AND KNOWLEDGE
This section describes the skills and knowledge required for this unit.
Required skills
Look for evidence that confirms skills in: • reading, interpreting and following information on standard operating procedures, manufacturer recommendations, drawings and other applicable reference documents • taking levelling and alignment measurements/readings • performing levelling/alignment calculations • setting up levelling/aligning equipment • completing levelling and/or alignment tasks
Required knowledge
Look for evidence that confirms knowledge of:

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REQUIRED SKILLS AND KNOWLEDGE
• principles of levelling and alignment • numerical operations, geometry and calculations/formulae for levelling and alignment • effects on equipment performance and life of non-level or out of alignment components • techniques, tools, equipment and procedures to carry out the levelling and/or alignment • reasons for selecting tools, techniques and equipment • hazards and control measures associated with levelling and alignment • use and application of personal protective equipment • safe work practices and procedures

Evidence Guide

EVIDENCE GUIDE	
The evidence guide provides advice on assessment and must be read in conjunction with the performance criteria, required skills and knowledge, range statement and the Assessment Guidelines for the Training Package.	
Overview of assessment	A person who demonstrates competency in this unit must be able to level and align machines and engineering components. Competency in this unit cannot be claimed until all prerequisites have been satisfied.
Critical aspects for assessment and evidence required to demonstrate competency in this unit	Assessors must be satisfied that the candidate can competently and consistently perform all elements of the unit as specified by the criteria, including required knowledge, and be capable of applying the competency in new and different situations and contexts.
Context of and specific resources for assessment	This unit may be assessed on the job, off the job or a combination of both on and off the job. Where assessment occurs off the job, that is the candidate is not in productive work, then an appropriate simulation must be used where the range of conditions reflects realistic workplace situations. The competencies covered by this unit would be demonstrated by an individual working alone or as part of a team. The assessment environment should not disadvantage the candidate. This unit could be assessed in conjunction with any other

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EVIDENCE GUIDE	
	units addressing the safety, quality, communication, materials handling, recording and reporting associated with levelling and aligning machines and engineering components or other units requiring the exercise of the skills and knowledge covered by this unit.
Method of assessment	Assessors should gather a range of evidence that is valid, sufficient, current and authentic. Evidence can be gathered through a variety of ways including direct observation, supervisor's reports, project work, samples and questioning. Questioning techniques should not require language, literacy and numeracy skills beyond those required in this unit of competency. The candidate must have access to all tools, equipment, materials and documentation required. The candidate must be permitted to refer to any relevant workplace procedures, product and manufacturing specifications, codes, standards, manuals and reference materials.
Guidance information for assessment	

Range Statement

RANGE STATEMENT	
The range statement relates to the unit of competency as a whole. It allows for different work environments and situations that may affect performance. Bold italicised wording, if used in the performance criteria, is detailed below. Essential operating conditions that may be present with training and assessment (depending on the work situation, needs of the candidate, accessibility of the item, and local industry and regional contexts) may also be included.	
Levelling and/or alignment procedures	Face and rim, reverse indicator, use of jacking bolts and shimming material, straight edge and feeler gauge, use of levelling equipment, etc.
Levelling and alignment devices/equipment	Precision levels, spirit levels, line levels, optical levels, electronic levels, laser levels, dial indicators, special type dial indicator fixtures, magnetic bases, feeler gauges, bench centres, vee blocks, plumb line, folding wedges, straight

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RANGE STATEMENT	
	edges, shimpack materials, dumpy levels etc.
Level or realignment calculation	Performed using the most appropriate means for the type of application being performed
Specifications	Obtained from engineering drawings, data sheets or manufacturers' specifications

Unit Sector(s)

Unit sector	

Co-requisite units

Co-requisite units		

Competency field

Competency field	Maintenance and diagnostics

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MEM18010C Perform equipment condition monitoring and recording

Modification History

Single band identifier removed to clarify dual status

Unit Descriptor

Unit descriptor	This unit covers undertaking condition monitoring.

Application of the Unit

Application of the unit	This unit applies where specialist monitoring activities are undertaken as part of a preventive maintenance or total productive maintenance plan or program. Work is undertaken autonomously or as part of a team environment. Monitoring is undertaken in workshop, laboratory or in situ environment; readings are undertaken to the accuracy of monitoring equipment limitations or to site specifications where applicable. Results are recorded/plotted to predetermined procedure and technique. All work and work procedures are undertaken to standard operating procedures and/or equipment manufacturers' recommendations. All work and work practices are undertaken to regulatory or legislative requirements. Where only routine maintenance checking and diagnostic skills are applied, other appropriate units should be accessed. **Band:** This unit has dual status and is to be regarded as both a Specialisation band A unit and Specialisation band B unit for progression to C5 (AQF level V). **Unit Weight**: **4**

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Licensing/Regulatory Information

Not Applicable

Pre-Requisites

Prerequisite units		
Path 1	MEM09002B	Interpret technical drawing
	MEM12023A	Perform engineering measurements
	MEM18001C	Use hand tools
	MEM18002B	Use power tools/hand held operations
	MEM18055B	Dismantle, replace and assemble engineering components

Employability Skills Information

Employability skills	This unit contains employability skills.

Elements and Performance Criteria Pre-Content

Elements describe the essential outcomes of a unit of competency.	Performance criteria describe the performance needed to demonstrate achievement of the element. Where bold italicised text is used, further information is detailed in the required skills and knowledge section and the range statement. Assessment of performance is to be consistent with the evidence guide.

Elements and Performance Criteria

ELEMENT	**PERFORMANCE CRITERIA**
1. Undertake condition	1.1. Principles and methods of equipment condition

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ELEMENT	PERFORMANCE CRITERIA
monitoring	monitoring are understood and applied 1.2. Appropriate condition monitoring technique is selected to achieve required outcomes. 1.3. Checks are undertaken correctly, safely and to standard operating procedures. 1.4. Results are plotted and deviations from specification are reported to appropriate authority and recorded.

Required Skills and Knowledge

REQUIRED SKILLS AND KNOWLEDGE
This section describes the skills and knowledge required for this unit.
Required skills
Look for evidence that confirms skills in: • reading, interpreting and following information on job instructions, specifications, standard operating procedures, charts, lists, drawings and other applicable reference documents • planning and sequencing operations • checking and clarifying task-related information • applying correct principles for monitoring • selecting appropriate technique for the situation • following standard operating procedures • recording results and preparing and submitting deviation reports
Required knowledge
Look for evidence that confirms knowledge of: • the application of principles and methods for a variety of situations • appropriate records for a variety of situations • hazards and control measures associated with equipment monitoring, including housekeeping • use and application of personal protective equipment • safe work practices and procedures

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Evidence Guide

EVIDENCE GUIDE	
The evidence guide provides advice on assessment and must be read in conjunction with the performance criteria, required skills and knowledge, range statement and the Assessment Guidelines for the Training Package.	
Overview of assessment	A person who demonstrates competency in this unit must be able to perform equipment condition monitoring and recording. Competency in this unit cannot be claimed until all prerequisites have been satisfied.
Critical aspects for assessment and evidence required to demonstrate competency in this unit	Assessors must be satisfied that the candidate can competently and consistently perform all elements of the unit as specified by the criteria, including required knowledge, and be capable of applying the competency in new and different situations and contexts.
Context of and specific resources for assessment	This unit may be assessed on the job, off the job or a combination of both. Where assessment occurs off the job, i.e. the candidate is not in productive work, an appropriate simulation must be used where the range of conditions reflects realistic workplace situations. The competencies covered by this unit would be demonstrated by an individual working alone or as part of a team. The assessment environment should not disadvantage the candidate. This unit could be assessed in conjunction with any other units addressing the safety, quality, communication, materials handling, recording and reporting associated with equipment condition monitoring and recording or other units requiring the exercise of the skills and knowledge covered by this unit.
Method of assessment	Assessors should gather a range of evidence that is valid, sufficient, current and authentic. Evidence can be gathered through a variety of ways including direct observation, supervisor's reports, project work, samples and questioning. Questioning techniques should not require language, literacy and numeracy skills beyond those required in this unit of competency. The candidate must have access to all tools, equipment, materials and documentation required. The candidate must be permitted to refer to any relevant workplace procedures, product and manufacturing specifications, codes, standards, manuals and reference materials.

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EVIDENCE GUIDE	
Guidance information for assessment	

Range Statement

RANGE STATEMENT	
The range statement relates to the unit of competency as a whole. It allows for different work environments and situations that may affect performance. Bold italicised wording, if used in the performance criteria, is detailed below. Essential operating conditions that may be present with training and assessment (depending on the work situation, needs of the candidate, accessibility of the item, and local industry and regional contexts) may also be included.	
Technique may include	Built-in systems (software and site displays), vibration monitors, infra-red and ultraviolet non-destructive testing

Unit Sector(s)

Unit sector	

Co-requisite units

Co-requisite units		

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Competency field

Competency field	Maintenance and diagnostics

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MEM18018C Maintain pneumatic system components

Modification History

Not Applicable

Unit Descriptor

Unit descriptor	This unit covers checking pneumatic system components, and identifying and repairing or replacing faulty components.

Application of the Unit

Application of the unit	Pneumatic system components are identified, inspected and assessed using fluid power principles to predetermined specifications interpreted from data sheets and circuits diagrams. Work is undertaken using predetermined standards of safety, quality and work procedures. Correct operational function of equipment components is confirmed and commissioned in conformance with specification, using standard operating procedures. For straightforward removals/replacement of components from a pneumatic system, Unit MEM18055B (Dismantle replace and assemble engineering components) or Unit MEM18071B (Connect/disconnect fluid conveying system components) should be regarded as sufficient. **Band**: **A** **Unit Weight**: **4**

Licensing/Regulatory Information

Not Applicable

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Pre-Requisites

Prerequisite units		
Path 1	MEM09002B	Interpret technical drawing
	MEM12023A	Perform engineering measurements
	MEM18001C	Use hand tools
	MEM18002B	Use power tools/hand held operations
	MEM18003C	Use tools for precision work
	MEM18006C	Repair and fit engineering components
	MEM18055B	Dismantle, replace and assemble engineering components

Employability Skills Information

Employability skills	This unit contains employability skills.

Elements and Performance Criteria Pre-Content

Elements describe the essential outcomes of a unit of competency.	Performance criteria describe the performance needed to demonstrate achievement of the element. Where bold italicised text is used, further information is detailed in the required skills and knowledge section and the range statement. Assessment of performance is to be consistent with the evidence guide.

Elements and Performance Criteria

ELEMENT	**PERFORMANCE CRITERIA**

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ELEMENT	PERFORMANCE CRITERIA
1. Check pneumatic system components	1.1. System components are identified correctly. 1.2. The characteristics and operational function of each system component are understood. 1.3. The operational function of each component is inspected and tested. 1.4. Correct operation of each component is assessed against specifications.
2. Identify, repair or replace faulty pneumatic system components	2.1. Faulty system components are localised and malfunction is confirmed by inspection and testing using fluid power principles, procedures and safety requirements. 2.2. Faulty system components are dismantled and repaired to manufacturers'/site specifications. 2.3. Replacement parts are selected from manufacturers' catalogue according to required specifications. 2.4. System components are reassembled and verified for correct operation and tested against specifications. 2.5. Correct operation of the pneumatic system is confirmed to standard operating procedures. 2.6. Appropriate follow-up procedures are adopted according to standard operating procedures. 2.7. Where appropriate, service reports are completed using standard operating procedures.

Required Skills and Knowledge

REQUIRED SKILLS AND KNOWLEDGE
This section describes the skills and knowledge required for this unit.
Required skills
Look for evidence that confirms skills in: • inspecting and testing pneumatic system components • obtaining, interpreting and following written job instructions, specifications, standard operating procedures, charts, lists, drawings, relevant data sheets and other applicable reference documents • planning and sequencing operations • checking and clarifying task-related information

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REQUIRED SKILLS AND KNOWLEDGE
• checking individual components within the pneumatic system for correct operation • dismantling and repairing faulty system components • selecting replacement parts from manufacturers'/suppliers' catalogues • assembling pneumatic system components • testing pneumatic components for correct operation and conformance to specifications • checking the operation of the pneumatic system for conformance to specification • checking repaired/replaced pneumatic system components for correct operation • completing service reports
Required knowledge
Look for evidence that confirms knowledge of: • the full range of pneumatic system components • characteristics/operational function of each component • procedures for inspecting and testing pneumatic system components • equipment to test pneumatic system components • the specifications of each pneumatic system component • faulty system components • causes of faulty pneumatic components • individual components within the pneumatic system • the safety procedures for working on pneumatic components • the procedure for repairing pneumatic system components • procedures for checking pneumatic system operation • follow-up procedures with respect to repaired/replaced pneumatic system components • reporting/recording procedures • hazard and control measures associated with maintaining pneumatic system components, including housekeeping • safe work practices and procedures

Evidence Guide

EVIDENCE GUIDE
The evidence guide provides advice on assessment and must be read in conjunction with the performance criteria, required skills and knowledge, range statement and the Assessment Guidelines for the Training Package.

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EVIDENCE GUIDE	
Overview of assessment	A person who demonstrates competency in this unit must be able to maintain pneumatic system components. Competency in this unit cannot be claimed until all prerequisites have been satisfied.
Critical aspects for assessment and evidence required to demonstrate competency in this unit	Assessors must be satisfied that the candidate can competently and consistently perform all elements of the unit as specified by the criteria, including required knowledge, and be capable of applying the competency in new and different situations and contexts.
Context of and specific resources for assessment	This unit may be assessed on the job, off the job or a combination of both on and off the job. Where assessment occurs off the job, that is the candidate is not in productive work, then an appropriate simulation must be used where the range of conditions reflects realistic workplace situations. The competencies covered by this unit would be demonstrated by an individual working alone or as part of a team. The assessment environment should not disadvantage the candidate. This unit could be assessed in conjunction with any other units addressing the safety, quality, communication, materials handling, recording and reporting associated with maintaining pneumatic system components or other units requiring the exercise of the skills and knowledge covered by this unit.
Method of assessment	Assessors should gather a range of evidence that is valid, sufficient, current and authentic. Evidence can be gathered through a variety of ways including direct observation, supervisor's reports, project work, samples and questioning. Questioning techniques should not require language, literacy and numeracy skills beyond those required in this unit of competency. The candidate must have access to all tools, equipment, materials and documentation required. The candidate must be permitted to refer to any relevant workplace procedures, product and manufacturing specifications, codes, standards, manuals and reference materials.
Guidance information for assessment	

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Range Statement

RANGE STATEMENT	
The range statement relates to the unit of competency as a whole. It allows for different work environments and situations that may affect performance. Bold italicised wording, if used in the performance criteria, is detailed below. Essential operating conditions that may be present with training and assessment (depending on the work situation, needs of the candidate, accessibility of the item, and local industry and regional contexts) may also be included.	
Pneumatic system components	Static and dynamic seals, linear and semi-rotary actuators, pressure control valves, directional control valves, flow control valves, normally open and closed timers, counters, pneumatic motors, fluid conductors and other associated equipment
Repair/replace	Repairs and replacements are conducted to site or manufacturers' specifications

Unit Sector(s)

Unit sector	

Co-requisite units

Co-requisite units		

Competency field

Competency field	Maintenance and diagnostics

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MEM18019B Maintain pneumatic systems

Modification History

Single band identifier removed to clarify dual status

Unit Descriptor

Unit descriptor	This unit covers undertaking preventive maintenance checks/adjustments on pneumatic systems, and fault finding, replacing, repairing or overhauling, and recommissioning pneumatic systems.

Application of the Unit

Application of the unit	The use of hand tools, power tools and specialist tools is included. Work tasks include preventative maintenance; testing diagnostic fault finding; adjustment, repair, replacement and overhauling of pneumatic systems to predetermined standards of quality, safety and work practices and procedures. Pneumatic components are identified, inspected and correct operational function is assessed using fluid power principles to predetermined specifications, interpreted from data sheets, manufacturers' catalogues, circuit diagrams and engineering drawings. Tests, checks, adjustments, repair, replacement and overhaul are undertaken on pneumatic assemblies/sub-assemblies, stationary/mobile equipment, pneumatic power tools according to site or manufacturers' specifications. Appropriate follow-up procedures are instigated, adopted and appropriate documentation is maintained. Work is undertaken autonomously or in a team environment. **Band:** This unit has dual status and is to be regarded as both a Specialisation band A unit and Specialisation band B unit for progression to C5 (AQF level V).

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	Unit Weight: **4**

Licensing/Regulatory Information

Not Applicable

Pre-Requisites

Prerequisite units		
Path 1	MEM09002B	Interpret technical drawing
	MEM12023A	Perform engineering measurements
	MEM18001C	Use hand tools
	MEM18002B	Use power tools/hand held operations
	MEM18003C	Use tools for precision work
	MEM18006C	Repair and fit engineering components
	MEM18018C	Maintain pneumatic system components
	MEM18055B	Dismantle, replace and assemble engineering components

Employability Skills Information

Employability skills	This unit contains employability skills.

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Elements and Performance Criteria Pre-Content

Elements describe the essential outcomes of a unit of competency.	Performance criteria describe the performance needed to demonstrate achievement of the element. Where bold italicised text is used, further information is detailed in the required skills and knowledge section and the range statement. Assessment of performance is to be consistent with the evidence guide.

Elements and Performance Criteria

ELEMENT	PERFORMANCE CRITERIA
1. Undertake preventative maintenance checks/adjustments on pneumatic systems	1.1. System components, assemblies or sub-assemblies are identified and prepared for inspection/preventative maintenance. 1.2. Visual inspection and testing with appropriate test equipment are carried out according to fluid power principles, procedures and safety requirements. 1.3. Scheduled preventative maintenance tasks are performed including obvious repairs and adjustments according to manufacturers' specification using fluid power techniques/practices.
2. Undertake fault finding on pneumatic systems	2.1. Designated pneumatic system components are identified and a visual inspection of the system is carried out for the collection of fault finding data. 2.2. System operator is consulted where appropriate and additional data is collected. 2.3. Maintenance reports and preventative maintenance schedules are checked and reviewed for additional fault finding data. 2.4. Using fluid power principles, checks and tests are undertaken using appropriate test equipment and techniques. 2.5. Faults and malfunctions are identified and verified. 2.6. Faults and malfunctions are documented or reported by appropriate means to designated personnel and actioned.
3. Repair and/or overhaul pneumatic power system	3.1. System or sub-assembly is isolated safely and residue pressure is discharged in accordance with prescribed procedures or checked for correct isolation. 3.2. Isolated system or sub-assembly is tagged according

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ELEMENT	PERFORMANCE CRITERIA
	to designated means. 3.3. Component or sub-assembly is removed from system using correct removal principles and techniques. 3.4. Components or sub-assemblies are dismantled, examined and verified for replacement, overhaul or repair, using correct and appropriate techniques and procedures. 3.5. Replacement items are selected from manufacturers' catalogues to meet specifications 3.6. Faulty items are repaired/replaced/overhauled, using correct and appropriate principles, techniques and procedures. 3.7. Component or sub-assembly items are refitted to equipment and tested for correct operation assessed against specifications.
4. Recommission pneumatic system	4.1. System or sub-assembly is recommissioned according to prescribed procedures and specifications. 4.2. Using fluid power principles and system application techniques, correct operation of the system is verified. 4.3. Appropriate follow-up procedures are instigated. 4.4. Maintenance records/service reports are updated and completed by appropriate designated means.

Required Skills and Knowledge

REQUIRED SKILLS AND KNOWLEDGE
This section describes the skills and knowledge required for this unit.
Required skills
Look for evidence that confirms skills in: • preparing pneumatic system components for inspection/preventative maintenance • inspecting and testing pneumatic system and components • performing scheduled preventative maintenance tasks • performing repairs on the pneumatic system/components as required • visually inspecting pneumatic system and its components for indications of

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REQUIRED SKILLS AND KNOWLEDGE
correct/incorrect operation • consulting system operator with respect to the fault being investigated • obtaining and interpreting maintenance reports and preventative maintenance schedules • checking/testing pneumatic system/component operation • verifying/confirming apparent faults/malfunctions • documenting or reporting verified faults/malfunctions • initiating repair/overhaul of the pneumatic system • isolating and depressurising pneumatic system • checking pneumatic system to ensure isolation and depressurisation • tagging isolated pneumatic system • removing pneumatic components/sub-assembly from the system • dismantling pneumatic components/sub-assemblies • examining pneumatic components/sub-assemblies and their parts for conformance to specification • selecting replacement parts selected from manufacturers' catalogues • overhauling faulty items • refitting pneumatic component/sub-assembly into the system • testing pneumatic component/sub-assembly for correct operation • recommissioning pneumatic system/sub-assembly to specification • checking/testing pneumatic system/sub-assembly for correct operation • initiating follow-up procedures • updating and completing maintenance records/reports
Required knowledge
Look for evidence that confirms knowledge of: • common pneumatic system components • pneumatic system/component faults that can be determined by visual inspection • the application of common pneumatic system/component test equipment • scheduled preventative maintenance tasks • manufacturers' specifications • common pneumatic system and component faults • any previous faults in the pneumatic system/components • any previous maintenance carried out on the pneumatic system/components • typical checks/tests that can be carried out on pneumatic systems/components and their application • pneumatic system/component tests and testing techniques • apparent faults/malfunctions • documentation/reporting requirements with respect to verified faults/malfunctions • procedures for initiating repair and/or overhaul of the pneumatic system

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REQUIRED SKILLS AND KNOWLEDGE
• hazards associated with working on pneumatic systems/components, including housekeeping • the procedures for isolating and depressurising pneumatic systems • the tagging requirements for isolated systems • the structure of typical pneumatic components • specifications of pneumatic components and their constituent parts • reasons for deciding to repair, replace or overhaul pneumatic components • system recommissioning procedures • the pneumatic system operational specifications • any appropriate follow-up maintenance or operational checks • maintenance recording/reporting requirements • consequences of inaccurate or incomplete recording/reporting of maintenance/service activities • pneumatic principles • safe work practices and procedures

Evidence Guide

EVIDENCE GUIDE	
The evidence guide provides advice on assessment and must be read in conjunction with the performance criteria, required skills and knowledge, range statement and the Assessment Guidelines for the Training Package.	
Overview of assessment	A person who demonstrates competency in this unit must be able to maintain pneumatic systems. Competency in this unit cannot be claimed until all prerequisites have been satisfied.
Critical aspects for assessment and evidence required to demonstrate competency in this unit	Assessors must be satisfied that the candidate can competently and consistently perform all elements of the unit as specified by the criteria, including required knowledge, and be capable of applying the competency in new and different situations and contexts.
Context of and specific resources for assessment	This unit may be assessed on the job, off the job or a combination of both on and off the job. Where assessment occurs off the job, that is the candidate is not in productive work, then an appropriate simulation must be used where the range of conditions reflects realistic workplace situations. The competencies covered by this

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EVIDENCE GUIDE	
	unit would be demonstrated by an individual working alone or as part of a team. The assessment environment should not disadvantage the candidate. This unit could be assessed in conjunction with any other units addressing the safety, quality, communication, materials handling, recording and reporting associated with maintaining and repairing pneumatic systems or other units requiring the exercise of the skills and knowledge covered by this unit.
Method of assessment	Assessors should gather a range of evidence that is valid, sufficient, current and authentic. Evidence can be gathered through a variety of ways including direct observation, supervisor's reports, project work, samples and questioning. Questioning techniques should not require language, literacy and numeracy skills beyond those required in this unit of competency. The candidate must have access to all tools, equipment, materials and documentation required. The candidate must be permitted to refer to any relevant workplace procedures, product and manufacturing specifications, codes, standards, manuals and reference materials.
Guidance information for assessment	

Range Statement

RANGE STATEMENT	
The range statement relates to the unit of competency as a whole. It allows for different work environments and situations that may affect performance. Bold italicised wording, if used in the performance criteria, is detailed below. Essential operating conditions that may be present with training and assessment (depending on the work situation, needs of the candidate, accessibility of the item, and local industry and regional contexts) may also be included.	
Preventative maintenance checks	Preventative maintenance is undertaken on a periodic basis and appropriate documentation is maintained
Systems	For the purposes of this unit, a system is regarded

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RANGE STATEMENT	
	as a functionally related group of elements. The unit extends to tests involving interacting, interrelated, or interdependent components
Test equipment	Leak testers, escape rate gauges, hand held pressure testers and other appropriate equipment
Repair	Rectify, replace components, determine for reuse

Unit Sector(s)

Unit sector	

Co-requisite units

Co-requisite units		

Competency field

Competency field	Maintenance and diagnostics

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MEM18020B Maintain hydraulic system components

Modification History

Not Applicable

Unit Descriptor

Unit descriptor	This unit covers checking hydraulic system components, and identifying and repairing or replacing faulty components.

Application of the Unit

Application of the unit	Hydraulic system components are identified, inspected and assessed using fluid power principles to predetermined specifications interpreted from data sheets and circuits diagrams. Work is undertaken using predetermined standards of safety, quality and work procedures. Repairs and replacements are undertaken to site or manufacturers' specifications. Correct operational function of equipment components is confirmed and commissioned in conformance to specifications, using standard operating procedures. For straightforward removals/replacement of components from a hydraulic system, Unit MEM18055B (Dismantle replace and assemble engineering components) or Unit MEM18071B (Connect/disconnect fluid conveying system components) should be regarded as sufficient. **Band**: **A** **Unit Weight**: **4**

Licensing/Regulatory Information

Not Applicable

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Pre-Requisites

Prerequisite units		
Path 1	MEM09002B	Interpret technical drawing
	MEM12023A	Perform engineering measurements
	MEM18001C	Use hand tools
	MEM18002B	Use power tools/hand held operations
	MEM18003C	Use tools for precision work
	MEM18006C	Repair and fit engineering components
	MEM18055B	Dismantle, replace and assemble engineering components

Employability Skills Information

Employability skills	This unit contains employability skills.

Elements and Performance Criteria Pre-Content

Elements describe the essential outcomes of a unit of competency.	Performance criteria describe the performance needed to demonstrate achievement of the element. Where bold italicised text is used, further information is detailed in the required skills and knowledge section and the range statement. Assessment of performance is to be consistent with the evidence guide.

Elements and Performance Criteria

ELEMENT	**PERFORMANCE CRITERIA**

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ELEMENT	PERFORMANCE CRITERIA
1. Check hydraulic system components	1.1. System components are identified correctly. 1.2. The characteristics and operational function of each system component are understood. 1.3. The operational function of each component is inspected and tested. 1.4. Correct operation of each component is assessed against specifications.
2. Identify and repair or replace faulty hydraulic system components	2.1. Faulty system components are localised and malfunction is confirmed by inspection and testing using fluid power principles, procedures and safety requirements. 2.2. Faulty system components are dismantled and rectified to manufacturers'/site specifications. 2.3. Replacement parts are selected from manufacturers' catalogues according to required specifications. 2.4. System components are reassembled and tested for correct operation and assessment against specifications. 2.5. Correct operation of the hydraulic system is confirmed to designated operating procedure. 2.6. Appropriate follow-up procedures are adopted according to standard operating procedures. 2.7. Where appropriate, service reports are completed using standard operating procedures.

Required Skills and Knowledge

REQUIRED SKILLS AND KNOWLEDGE
This section describes the skills and knowledge required for this unit.
Required skills
Look for evidence that confirms skills in: • inspecting a range of hydraulic system components in accordance with standard operating procedures • reading, interpreting and following relevant data sheets, specifications, hydraulic circuits, drawings, instructions and manuals • checking the individual components within the hydraulic system for correct

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REQUIRED SKILLS AND KNOWLEDGE
operation • dismantling and rectifying faulty system components to manufacturers'/site specifications in accordance with standard operating procedures • where appropriate, selecting replacement parts from the manufacturers'/suppliers' catalogues • reassembling and testing the hydraulic system components • checking the operation of the hydraulic system for conformance to specification • checking repaired/replaced hydraulic system components for correct operation • completing service reports where appropriate
Required knowledge
Look for evidence that confirms knowledge of: • the full range of hydraulic system components • characteristics and operational function of each hydraulic system component • procedures for inspecting and testing hydraulic system components • equipment required to test hydraulic system components • specifications of each hydraulic system component • hydraulic components not operating in accordance with specifications • reasons for hydraulic components not operating in accordance with specification • individual components within the hydraulic system • safety procedures to be followed when working on hydraulic components • where appropriate, faulty system components • procedure for repairing hydraulic system components • parts to be replaced • reasons for replacing the parts identified • the correct operation of the hydraulic system • procedures for checking hydraulic system operation • where appropriate, the follow-up procedures with respect to repaired/replaced hydraulic system components • reporting/recording procedures • reasons for completing service reports for hydraulic system components repaired/replaced • hazards associated with maintaining hydraulic system components, including housekeeping • safe work practices and procedures

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Evidence Guide

EVIDENCE GUIDE	
The evidence guide provides advice on assessment and must be read in conjunction with the performance criteria, required skills and knowledge, range statement and the Assessment Guidelines for the Training Package.	
Overview of assessment	A person who demonstrates competency in this unit must be able to maintain hydraulic system components. Competency in this unit cannot be claimed until all prerequisites have been satisfied.
Critical aspects for assessment and evidence required to demonstrate competency in this unit	Assessors must be satisfied that the candidate can competently and consistently perform all elements of the unit as specified by the criteria, including required knowledge, and be capable of applying the competency in new and different situations and contexts.
Context of and specific resources for assessment	This unit may be assessed on the job, off the job or a combination of both on and off the job. Where assessment occurs off the job, that is the candidate is not in productive work, then an appropriate simulation must be used where the range of conditions reflects realistic workplace situations. The competencies covered by this unit would be demonstrated by an individual working alone or as part of a team. The assessment environment should not disadvantage the candidate. This unit could be assessed in conjunction with any other units addressing the safety, quality, communication, materials handling, recording and reporting associated with maintaining hydraulic system components or other units requiring the exercise of the skills and knowledge covered by this unit.
Method of assessment	Assessors should gather a range of evidence that is valid, sufficient, current and authentic. Evidence can be gathered through a variety of ways including direct observation, supervisor's reports, project work, samples and questioning. Questioning techniques should not require language, literacy and numeracy skills beyond those required in this unit of competency. The candidate must have access to all tools, equipment, materials and documentation required. The candidate must be permitted to refer to any relevant workplace procedures, product and manufacturing specifications, codes, standards, manuals and reference materials.

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EVIDENCE GUIDE	
Guidance information for assessment	

Range Statement

RANGE STATEMENT	
The range statement relates to the unit of competency as a whole. It allows for different work environments and situations that may affect performance. Bold italicised wording, if used in the performance criteria, is detailed below. Essential operating conditions that may be present with training and assessment (depending on the work situation, needs of the candidate, accessibility of the item, and local industry and regional contexts) may also be included.	
Hydraulic system components	Hydraulic system components may include static and dynamic seals, linear and semi-rotary actuators, fixed displacement and variable displacement pumps, pressure control valves, directional control valves, flow control valves, hydraulic motors, reservoirs, contamination control components (filtration), fluid conductors/fittings and other associated equipment.

Unit Sector(s)

Unit sector	

Co-requisite units

Co-requisite units		

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Co-requisite units		

Competency field

Competency field	Maintenance and diagnostics

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MEM18021B Maintain hydraulic systems

Modification History

Single Band identifier removed to clarify dual status

Unit Descriptor

Unit descriptor	This unit covers undertaking preventive maintenance checks/adjustments on hydraulic systems, and fault finding, repairing, rectifying or overhauling, and recommissioning hydraulic systems.

Application of the Unit

Application of the unit	The use of hand tools, power tools and specialist tools is included. Work tasks include the preventative maintenance, testing, diagnostic fault finding, adjustment, repair, replacement and overhauling of hydraulic systems to predetermined standards of quality, safety and work practices and procedures. Hydraulic components are identified, inspected and correct operational function is assessed using fluid power principles to predetermined specifications, interpreted from data sheets, manufacturers' catalogues, circuit diagrams and engineering drawings. Appropriate follow-up procedures are instigated, adopted and appropriate documentation is maintained. Work is undertaken autonomously or in a team environment. **Band:** This unit has dual status and is to be regarded as both a Specialisation band A unit and Specialisation band B unit for progression to C5 (AQF level V). **Unit Weight**: **4**

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Licensing/Regulatory Information

Not Applicable

Pre-Requisites

Prerequisite units		
Path 1	MEM09002B	Interpret technical drawing
	MEM12023A	Perform engineering measurements
	MEM18001C	Use hand tools
	MEM18002B	Use power tools/hand held operations
	MEM18003C	Use tools for precision work
	MEM18006C	Repair and fit engineering components
	MEM18020B	Maintain hydraulic system components
	MEM18055B	Dismantle, replace and assemble engineering components

Employability Skills Information

Employability skills	This unit contains employability skills.

Elements and Performance Criteria Pre-Content

Elements describe the essential outcomes of a unit of competency.	Performance criteria describe the performance needed to demonstrate achievement of the element. Where bold italicised text is used, further information is detailed in the required skills and knowledge section and the range statement. Assessment of performance is to be consistent with the evidence guide.

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Elements and Performance Criteria

ELEMENT	PERFORMANCE CRITERIA
1. Undertake preventative maintenance checks/adjustments on hydraulic systems	1.1. System components, assemblies or sub-assemblies are identified and prepared for inspection/preventative maintenance. 1.2. Visual inspection and testing with appropriate test equipment are carried out according to fluid power principles, procedures and safety requirements. 1.3. Scheduled preventive maintenance tasks are performed including obvious repairs and adjustments according to manufacturers' specifications using fluid power techniques/practices.
2. Undertake fault finding on hydraulic systems	2.1. Designated hydraulic system components are identified and a visual inspection of the system is carried out for the collection of fault finding data. 2.2. System operator is consulted where appropriate and additional data is collected. 2.3. Maintenance reports and preventative maintenance schedules are checked and reviewed for additional fault finding data. 2.4. Using fluid power principles, checks and tests are undertaken using appropriate test equipment and techniques. 2.5. Faults and malfunctions are identified and verified. 2.6. Faults and malfunctions are documented or reported by appropriate means to designated personnel and actioned.
3. Repair and/or rectify hydraulic system	3.1. System or sub-assembly is isolated safely and residue pressure is discharged in accordance with prescribed procedure and checked for correct isolation. 3.2. Isolated system or sub-assembly is tagged according to designated means. 3.3. Components or sub-assembly is removed from system using correct removal principles and techniques. 3.4. Components or sub-assemblies are dismantled, examined and verified for replacement, overhaul or repair, using correct and appropriate techniques and

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ELEMENT	PERFORMANCE CRITERIA
	procedures. 3.5. Replacement items are selected from manufacturers' catalogues to meet specifications. 3.6. Faulty items are rectified using correct and appropriate principles, techniques and procedures. 3.7. Component or sub-assembly items are refitted to equipment and tested for correct operation against specifications.
4. Recommission hydraulic system	4.1. System or sub-assembly is recommissioned according to prescribed procedures and specifications. 4.2. Using fluid power principles and system applications techniques, correct operation of the system is verified. 4.3. Appropriate follow-up procedures are instigated. 4.4. Maintenance records/service reports are updated and completed by appropriate designated means.

Required Skills and Knowledge

REQUIRED SKILLS AND KNOWLEDGE
This section describes the skills and knowledge required for this unit.
Required skills
Look for evidence that confirms skills in: • preparing hydraulic system components for inspection/preventative maintenance • inspecting and testing the hydraulic system/components • planning and sequencing operations • performing scheduled preventative maintenance tasks • where appropriate, performing obvious repairs on the hydraulic system/components • visually inspect the hydraulic system and its components for indications of correct/incorrect operation • where appropriate, consulting with the system operator with respect to the fault being investigated • obtaining and interpreting maintenance reports and preventative maintenance schedules • using appropriate test equipment and techniques to check/test hydraulic

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REQUIRED SKILLS AND KNOWLEDGE
system/component operation • verifying apparent faults/malfunctions • documenting or reporting all verified faults/malfunctions • initiating the repair/overhaul of the hydraulic system • isolating and depressurising the hydraulic system • tagging the isolated hydraulic system • removing the hydraulic components/sub-assembly from the system • dismantling the hydraulic components/sub-assemblies • examining the hydraulic components/sub-assemblies and their parts for conformance to specification • selecting replacement parts from manufacturers' catalogues in compliance with specifications • repairing/replacing/overhauling faulty items • refitting the hydraulic component/sub-assembly into the system • testing the hydraulic component/sub-assembly for correct operation and compliance with specifications • recommissioning the hydraulic system/sub-assembly to specification • checking/testing the hydraulic system/sub-assembly for correct operation • where appropriate, initiating follow-up procedures • updating and completing all maintenance records/reports
Required knowledge
Look for evidence that confirms knowledge of: • common hydraulic system components • hydraulic system/component faults that can be determined by visual inspection • the application of common hydraulic system/component test equipment • schedule of preventative maintenance tasks • the manufacturers' specifications • common hydraulic system and component faults • any previous faults in the hydraulic system/components • any previous maintenance carried out on the hydraulic system/components • typical checks/tests that can be carried out on hydraulic systems/components and their application • hydraulic system/component test and testing techniques • apparent faults/malfunctions • the documentation/reporting requirements with respect to verified faults/malfunctions • the procedures for initiating repair/replacement and/or overhaul of the hydraulic system • the hazards and control measures associated with working on hydraulic systems/components, including housekeeping

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REQUIRED SKILLS AND KNOWLEDGE
• the procedures for isolating and depressurising hydraulic systems • tagging requirements for isolated systems • the structure of typical hydraulic components • the specifications of hydraulic components and their constituent parts • the appropriate repair/overhaul procedures • system recommissioning procedures • the hydraulic system operational specifications • any appropriate follow-up maintenance or operational checks • the maintenance recording/reporting requirements • the consequences of inaccurate or incomplete recording/reporting of maintenance/service activities • safe work practices and procedures

Evidence Guide

EVIDENCE GUIDE	
The evidence guide provides advice on assessment and must be read in conjunction with the performance criteria, required skills and knowledge, range statement and the Assessment Guidelines for the Training Package.	
Overview of assessment	A person who demonstrates competency in this unit must be able to maintain hydraulic systems. Competency in this unit cannot be claimed until all prerequisites have been satisfied.
Critical aspects for assessment and evidence required to demonstrate competency in this unit	Assessors must be satisfied that the candidate can competently and consistently perform all elements of the unit as specified by the criteria, including required knowledge, and be capable of applying the competency in new and different situations and contexts.
Context of and specific resources for assessment	This unit may be assessed on the job, off the job or a combination of both on and off the job. Where assessment occurs off the job, that is the candidate is not in productive work, then an appropriate simulation must be used where the range of conditions reflects realistic workplace situations. The competencies covered by this unit would be demonstrated by an individual working alone or as part of a team. The assessment environment should not disadvantage the candidate.

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EVIDENCE GUIDE	
	This unit could be assessed in conjunction with any other units addressing the safety, quality, communication, materials handling, recording and reporting associated with maintaining and repairing hydraulic systems or other units requiring the exercise of the skills and knowledge covered by this unit.
Method of assessment	Assessors should gather a range of evidence that is valid, sufficient, current and authentic. Evidence can be gathered through a variety of ways including direct observation, supervisor's reports, project work, samples and questioning. Questioning techniques should not require language, literacy and numeracy skills beyond those required in this unit of competency. The candidate must have access to all tools, equipment, materials and documentation required. The candidate must be permitted to refer to any relevant workplace procedures, product and manufacturing specifications, codes, standards, manuals and reference materials.
Guidance information for assessment	

Range Statement

RANGE STATEMENT	
The range statement relates to the unit of competency as a whole. It allows for different work environments and situations that may affect performance. Bold italicised wording, if used in the performance criteria, is detailed below. Essential operating conditions that may be present with training and assessment (depending on the work situation, needs of the candidate, accessibility of the item, and local industry and regional contexts) may also be included.	
Preventative maintenance	Preventative maintenance is undertaken on a periodic basis and appropriate documentation is maintained
Systems	For the purposes of this unit a system is regarded as a functionally related group of elements. The unit extends to tests involving interacting, interrelated, or interdependent components

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RANGE STATEMENT	
Test equipment	Leak testers, escape rate gauges, hand held pressure testers and other appropriate equipment
Rectify	Replacement, repair and/or reuse of components

Unit Sector(s)

Unit sector	

Co-requisite units

Co-requisite units		

Competency field

Competency field	Maintenance and diagnostics

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MEM18022B Maintain fluid power controls

Modification History

Single band identifier removed to clarify dual status

Unit Descriptor

Unit descriptor	This unit covers installing and repairing and/or rectifying fluid power controls, and adjusting fluid power system control sequence and operation.

Application of the Unit

Application of the unit	It also covers fault finding of fluid power systems control circuits, maintaining and repairing or replacing system control components and checking and adjusting the sequence of fluid power system controls. System circuit/components are identified, traced, inspected and operational function is assessed and verified using fluid power principles to predetermined specifications interpreted from data sheets and circuit diagrams. Work is undertaken using predetermined standards of quality, safety and work procedures, autonomously or in a team environment. Installation, adjustment, repairs, replacements and overhauls are undertaken to site or manufacturers' specifications using working knowledge and application of principles of fluid power systems control sequencing which may include: PLCs, relay logic control systems, unitised/modular sensors, transducers, timers, counters and associated equipment. If skills beyond the sequencing of PLC controls are required, then Units MEM10004B (Enter and change programmable controller operational parameters) and/or Unit MEM10005B (Commission programmable controller programs) should also be accessed. **Band:** This unit has dual status and is to be regarded as both a Specialisation band A unit and Specialisation band B unit

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	for progression to C5 (AQF level V). **Unit Weight**: **8**

Licensing/Regulatory Information

Not Applicable

Pre-Requisites

Prerequisite units		
Path 1	MEM09002B	Interpret technical drawing
	MEM12023A	Perform engineering measurements
	MEM18001C	Use hand tools
	MEM18002B	Use power tools/hand held operations
	MEM18003C	Use tools for precision work
	MEM18006C	Repair and fit engineering components
	MEM18018C	Maintain pneumatic system components
	MEM18019B	Maintain pneumatic systems
	MEM18055B	Dismantle, replace and assemble engineering components
Path 2	MEM09002B	Interpret technical drawing
	MEM12023A	Perform engineering measurements
	MEM18001C	Use hand tools
	MEM18002B	Use power tools/hand held operations
	MEM18003C	Use tools for precision work

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Prerequisite units		
	MEM18006C	Repair and fit engineering components
	MEM18020B	Maintain hydraulic system components
	MEM18021B	Maintain hydraulic systems
	MEM18055B	Dismantle, replace and assemble engineering components

Employability Skills Information

Employability skills	This unit contains employability skills.

Elements and Performance Criteria Pre-Content

Elements describe the essential outcomes of a unit of competency.	Performance criteria describe the performance needed to demonstrate achievement of the element. Where bold italicised text is used, further information is detailed in the required skills and knowledge section and the range statement. Assessment of performance is to be consistent with the evidence guide.

Elements and Performance Criteria

ELEMENT	**PERFORMANCE CRITERIA**
1. Install/replace fluid power systems and controls	1.1. Fluid power control principles and system/circuit diagrams are interpreted and understood. 1.2. System/circuit components are identified and inspected for compliance with specifications. 1.3. Sequential installation is undertaken according to manufacturers' specifications and standard operating procedures.

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ELEMENT	PERFORMANCE CRITERIA
2. Check and adjust fluid power system control sequence and operation	2.1. Controls and system operation is checked against operational specifications using appropriate test equipment and application principles/techniques. 2.2. Adjustments are performed to sequence system to meet/align to operational requirements and specifications. 2.3. Modifications/alterations are recorded and reported in accordance with standard operating procedures. 2.4. Controls and system operation is checked and commissioned to specifications.
3. Fault find fluid power systems control circuit	3.1. System/circuit diagrams and data sheets are interpreted and understood. 3.2. System/circuit components are identified and inspected. 3.3. System/circuit is traced and action of components is diagnosed to identify and localise faults. 3.4. System/circuit parts are tested using appropriate test equipment and application principles. 3.5. System/circuit parts are assessed against operational specifications. 3.6. Fault condition is localised at the component level. 3.7. Faulty condition is evaluated, root cause is analysed and corrective action is planned.
4. Maintain and repair or rectify system control components	4.1. Correct maintenance procedures are applied according to standard operating procedures. 4.2. Repair procedures are selected and applied using correct and appropriate techniques, tools and equipment. 4.3. Faulty items are tested, repaired or replaced using sequential installation procedures according to manufacturers' recommendations. 4.4. Replacement items are selected from manufacturers' catalogues to meet specifications. 4.5. System control components are reassembled using appropriate principles and procedures according to specifications required.
5. Check and adjust sequence of fluid power system controls	5.1. Using circuit diagrams and fluid power system control principles, circuit sensors and controllers are identified. 5.2. Necessary adjustments to sequence system control circuit are made to meet operational specification.

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ELEMENT	PERFORMANCE CRITERIA
	5.3. Correct operation of system control circuit is checked against operational specification. 5.4. Correct operation is confirmed. 5.5. Fluid power system controls are commissioned to specifications. 5.6. Appropriate follow-up procedures are adopted. 5.7. Service/maintenance report is completed to standard operating procedures.

Required Skills and Knowledge

REQUIRED SKILLS AND KNOWLEDGE
This section describes the skills and knowledge required for this unit.
Required skills
Look for evidence that confirms skills in: • obtaining and interpreting system/circuit diagrams, system operation data sheets and control data • planning and sequencing operations • checking/inspecting system/circuit components for compliance with specifications • undertaking installation of the fluid power system and controls in accordance with manufacturers' specifications and work site procedures • using test equipment to check control and system operation against specification • adjusting the system where appropriate, to ensure that the sequence of operations conforms to operational requirements • recording/reporting any modifications/alterations to the system • checking the operation of the controls and system for conformance to specification • commissioning the system in accordance with work site procedures • identifying and localising components not conforming to operational specification • conducting appropriate maintenance in accordance with work site procedures • repairing control components where appropriate • testing faulty items for conformance to specification • installing repaired/replaced components • selecting replacement items from manufacturers' catalogues • reassembling control components • initiating maintenance and/or service follow-up procedures • completing maintenance and/or service reports

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REQUIRED SKILLS AND KNOWLEDGE
Required knowledge
Look for evidence that confirms knowledge of: • system operational and control requirements and specifications • the application of common fluid power system components and controllers • the system/circuit components • any special installation requirements • fluid power test equipment and application • the correct operational sequence of the system • typical adjustments to correct sequencing variations from specification • the consequences of not recording/reporting modifications to systems • the procedures for recording/reporting modifications/alterations • the fluid power system commissioning procedures • common test equipment and its application • the component(s) not complying with operational specification • typical causes of component failure • the cause of the faulty condition in the component(s) • appropriate procedures for rectifying the faulty condition • the appropriate maintenance schedule and procedures • appropriate control component repair procedures • typical test equipment and its application • circuit sensors and controllers • common adjustments that can be made to control systems and their effect • any maintenance/service follow-up procedures • the maintenance/service recording/reporting requirements • hazards and control measures associated with maintaining and rectifying fluid power controls, including housekeeping • safe work practices and procedures

Evidence Guide

EVIDENCE GUIDE	
The evidence guide provides advice on assessment and must be read in conjunction with the performance criteria, required skills and knowledge, range statement and the Assessment Guidelines for the Training Package.	
Overview of assessment	A person who demonstrates competency in this unit must

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EVIDENCE GUIDE	
	be able to maintain fluid power controls. Competency in this unit cannot be claimed until all prerequisites have been satisfied.
Critical aspects for assessment and evidence required to demonstrate competency in this unit	Assessors must be satisfied that the candidate can competently and consistently perform all elements of the unit as specified by the criteria, including required knowledge, and be capable of applying the competency in new and different situations and contexts.
Context of and specific resources for assessment	This unit may be assessed on the job, off the job or a combination of both on and off the job. Where assessment occurs off the job, that is the candidate is not in productive work, then an appropriate simulation must be used where the range of conditions reflects realistic workplace situations. The competencies covered by this unit would be demonstrated by an individual working alone or as part of a team. The assessment environment should not disadvantage the candidate. This unit could be assessed in conjunction with any other units addressing the safety, quality, communication, materials handling, recording and reporting associated with maintaining and rectifying fluid power controls or other units requiring the exercise of the skills and knowledge covered by this unit.
Method of assessment	Assessors should gather a range of evidence that is valid, sufficient, current and authentic. Evidence can be gathered through a variety of ways including direct observation, supervisor's reports, project work, samples and questioning. Questioning techniques should not require language, literacy and numeracy skills beyond those required in this unit of competency. The candidate must have access to all tools, equipment, materials and documentation required. The candidate must be permitted to refer to any relevant workplace procedures, product and manufacturing specifications, codes, standards, manuals and reference materials.
Guidance information for assessment	

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Range Statement

RANGE STATEMENT	
The range statement relates to the unit of competency as a whole. It allows for different work environments and situations that may affect performance. Bold italicised wording, if used in the performance criteria, is detailed below. Essential operating conditions that may be present with training and assessment (depending on the work situation, needs of the candidate, accessibility of the item, and local industry and regional contexts) may also be included.	
Fluid power control principles	PLCs, relay logic control systems, unitised/modular sensors, transducers, timers, counters and associated equipment

Unit Sector(s)

Unit sector	

Co-requisite units

Co-requisite units		

Competency field

Competency field	Maintenance and diagnostics

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MEM18055B Dismantle, replace and assemble engineering components

Modification History

Not Applicable

Unit Descriptor

Unit descriptor	This unit covers dismantling and identifying faulty components, selecting replacements, and assembling engineering components into assemblies or sub-assemblies in accordance with standard operating procedures.

Application of the Unit

Application of the unit	This unit involves dismantling, checking, replacing and assembling engineering components in accordance with standard operating procedures. All specifications are interpreted from manufacturers' manuals, engineering drawings, detailed/technical sketches and associated data sheets. Tasks are undertaken utilising engineering principles, designated procedures, appropriate tools, equipment and safe workshop practices. Work is undertaken autonomously or in a team environment using predetermined standards of quality, safety and workshop procedures. Where fitting techniques and principles are required to assess component condition, and/or modify components to achieve precision fits, unit MEM18006C (Repair and fit engineering components) should also be selected. Where precision mechanical measurement is required, then Unit MEM12003B (Perform precision mechanical measurement) should also be selected. **Band**: **A** **Unit Weight**: **3**

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Licensing/Regulatory Information

Not Applicable

Pre-Requisites

Prerequisite units		
Path 1	MEM09002B	Interpret technical drawing
	MEM12023A	Perform engineering measurements
	MEM18001C	Use hand tools
	MEM18002B	Use power tools/hand held operations

Employability Skills Information

Employability skills	This unit contains employability skills.

Elements and Performance Criteria Pre-Content

Elements describe the essential outcomes of a unit of competency.	Performance criteria describe the performance needed to demonstrate achievement of the element. Where bold italicised text is used, further information is detailed in the required skills and knowledge section and the range statement. Assessment of performance is to be consistent with the evidence guide.

Elements and Performance Criteria

ELEMENT	**PERFORMANCE CRITERIA**
1. Dismantle engineering	1.1. Engineering components are inspected and task

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ELEMENT	PERFORMANCE CRITERIA
components	requirements are analysed. 1.2. Appropriate tools and equipment are selected and component/s are prepared for dismantling. 1.3. Component is dismantled using standard operating procedures, tools and equipment. 1.4. Engineering components are clearly marked to aid reassembly.
2. Identify faulty components	2.1. Specifications for components are obtained from appropriate source and are interpreted and understood. 2.2. Damaged or faulty components are assessed against specifications according to standard operating procedures. 2.3. Faulty components are identified for repair, replacement or adjustment according to standard operating procedures.
3. Select replacement components	3.1. Where applicable, replacement and/or repaired parts are selected for reassembly according to standard operating procedures.
4. Assemble engineering components into assemblies or sub-assemblies	4.1. Appropriate techniques are applied in the preparation, assembly and adjustment of components using fastening equipment and methods which ensure conformance to specifications, operational performance, quality and safety of the completed assembly according to standard operating procedures. 4.2. Correct lubrication, packing, sealing materials are selected and applied correctly in conformance to job specifications. 4.3. Final component assembly is inspected, tested and adjusted as necessary for compliance with operational specifications and returned to use according to standard operating procedures.

Required Skills and Knowledge

REQUIRED SKILLS AND KNOWLEDGE
This section describes the skills and knowledge required for this unit.

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REQUIRED SKILLS AND KNOWLEDGE

Required skills

Look for evidence that confirms skills in:

- obtaining and interpreting all relevant instructions, standard operating procedures, drawings and specifications
- preparing component for dismantling
- dismantling components using appropriate techniques, tools and equipment
- marking component parts appropriately for identification purposes
- checking components visually and dimensionally for conformance to specification
- where appropriate, marking faulty parts for repair, replacement or adjustment
- selecting and confirming replacement parts to specifications
- obtaining and using all relevant supplier catalogues
- preparing and assembling components using appropriate techniques in accordance with standard operating procedures
- where appropriate, applying lubricants correctly to the assembly in accordance with specifications and standard operating procedures
- where appropriate, applying packing and/or sealing materials in accordance with specifications and standard operating procedures
- inspecting and checking the final assembly for conformance to specification
- where appropriate, returning the final assembly to use

Required knowledge

Look for evidence that confirms knowledge of:

- tasks to be performed in accordance with standard operating procedures
- procedures for dismantling the assembly
- tools and equipment to be used to dismantle the components
- procedures and required equipment for checking components for conformance to specification
- specifications of the components to be replaced
- features and/or dimensions upon which replacement parts are to be selected
- process of identifying replacement parts from "third party" suppliers' catalogues
- procedures for assembling components
- requirements of the assembly in terms of specifications, operational performance, quality and safety
- procedures for lubricating the assembly
- materials
- checks to be undertaken during inspection of the final assembly
- procedures for returning components/assemblies into use
- hazards and control measures associated with dismantling, replacing and assembling engineering components, including housekeeping

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REQUIRED SKILLS AND KNOWLEDGE
• safe work practices and procedures

Evidence Guide

EVIDENCE GUIDE	
The evidence guide provides advice on assessment and must be read in conjunction with the performance criteria, required skills and knowledge, range statement and the Assessment Guidelines for the Training Package.	
Overview of assessment	A person who demonstrates competency in this unit must be able to dismantle, replace and assemble engineering components. Competency in this unit cannot be claimed until all prerequisites have been satisfied.
Critical aspects for assessment and evidence required to demonstrate competency in this unit	Assessors must be satisfied that the candidate can competently and consistently perform all elements of the unit as specified by the criteria, including required knowledge, and be capable of applying the competency in new and different situations and contexts.
Context of and specific resources for assessment	This unit may be assessed on the job, off the job or a combination of both on and off the job. Where assessment occurs off the job, that is the candidate is not in productive work, then an appropriate simulation must be used where the range of conditions reflects realistic workplace situations. The competencies covered by this unit would be demonstrated by an individual working alone or as part of a team. The assessment environment should not disadvantage the candidate. This unit could be assessed in conjunction with any other units addressing the safety, quality, communication, materials handling, recording and reporting associated with dismantling, replacing and assembling engineering components or other units requiring the exercise of the skills and knowledge covered by this unit.
Method of assessment	Assessors should gather a range of evidence that is valid, sufficient, current and authentic. Evidence can be gathered through a variety of ways including direct observation, supervisor's reports, project work, samples and questioning. Questioning techniques should not

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EVIDENCE GUIDE	
	require language, literacy and numeracy skills beyond those required in this unit of competency. The candidate must have access to all tools, equipment, materials and documentation required. The candidate must be permitted to refer to any relevant workplace procedures, product and manufacturing specifications, codes, standards, manuals and reference materials.
Guidance information for assessment	

Range Statement

RANGE STATEMENT	
The range statement relates to the unit of competency as a whole. It allows for different work environments and situations that may affect performance. Bold italicised wording, if used in the performance criteria, is detailed below. Essential operating conditions that may be present with training and assessment (depending on the work situation, needs of the candidate, accessibility of the item, and local industry and regional contexts) may also be included.	
Engineering components	Includes a range of component parts found in equipment or product assemblies, sub-assemblies, e.g. couplings, universal joints, pumps etc. employing shafts, pre-manufactured bearings and seals, lubricants, fasteners, gaskets etc.
Appropriate tools and equipment	Includes a range of hand and power tools, bearing pullers, special purpose dismantling and assembly tools etc.
Selected	Replacement parts are selected from manufacturers' catalogues, etc.
Appropriate techniques	Are in accordance with standard operating procedures and may include the straightforward removal and replacement of pre-manufactured bearings and seals

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Unit Sector(s)

Unit sector	

Co-requisite units

Co-requisite units		

Competency field

Competency field	Maintenance and diagnostics

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NWPGEN007 Sample and test drinking water

Modification History

Release	Comments
1	This unit was released in NWP Water Training Package release 1.0 and meets the Standards for Training Packages. • New unit • Created drawing upon information from deleted units NWP208A and NWP218B

Application

This unit describes the skills required to collect and prepare drinking water samples and to perform basic water quality tests. This unit does not include off-site laboratory testing.

This unit applies to those working in field operations in the water industry, but might be relevant to others.

The skills and knowledge described in this unit must be applied within the legislative, regulatory and policy environment in which they are carried out. Organisational policies and procedures must be consulted and adhered to.

Those undertaking this unit would work under supervision, while performing routine tasks in a range of familiar contexts.

No licensing, legislative or certification requirements apply to unit at the time of publication.

Competency Field

General

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Elements and Performance Criteria

ELEMENTS	PERFORMANCE CRITERIA
Elements describe the essential outcomes	Performance criteria describe the performance needed to demonstrate achievement of the element. Where bold italicised text is used, further information is detailed in the range of conditions section.
1. Prepare for water quality sampling and testing	1.1 Receive instructions for taking samples and conducting basic water quality tests. 1.2 Confirm and record samples and tests to comply with requirements. 1.3 Select, check and prepare equipment and resources. 1.4 Select and apply relevant sample preservation methods. 1.5 Select, fit and use personal protective equipment.
2. Conduct water quality sampling and testing	2.1 Adopt hygienic work practices. 2.2 Collect samples ensuring that types, locations and times comply with requirements. 2.3 Prepare samples for off-site laboratory testing according to requirements. 2.4 Maintain integrity of samples during sampling and on-site testing. 2.5 Conduct basic on-site water quality tests. 2.6 Assess and report abnormal characteristics and apply incident management principles. 2.7 Record samples and results of on-site analysis. 2.8 Limit hazards and contamination to self, work area and environment.
3. Finalise work	3.1 Apply chain of custody principles. 3.2 Report observations or measurements requiring further action. 3.3 Dispose of samples and clean and store test equipment. 3.4 Clear and restore work area.

Foundation Skills

The foundation skills demands of this unit have been mapped for alignment with the Australian Core Skills Framework (ACSF). The following tables outline the performance levels indicated for successful attainment of the unit.

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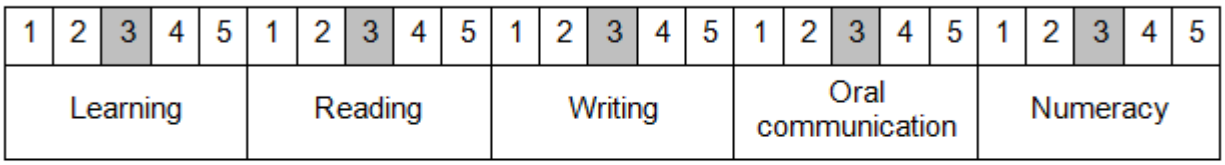
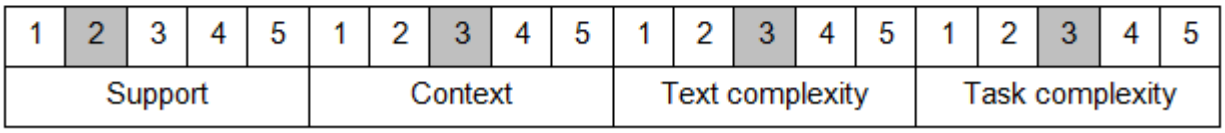
ACSF levels indicative of performance:



Performance variables:



Further information on ACSF and the foundation skills underpinning this unit can be found in the Foundation Skills Guide on the GSA website.

Range of Conditions

Types of sampling conditions includes:	• physical • microbial • chemical • radiological
On-site tests include:	• turbidity • pH • dissolved oxygen • electrical conductivity • chlorine • temperature • colour
Types of sampling areas include:	• surface • ground • drinking • seawater

Unit Mapping Information

No equivalent unit.

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Links

Companion Volume implementation guides are found in VETNet - https://vetnet.gov.au/Pages/TrainingDocs.aspx?q=26336bc0-04e5-49d9-8c31-46c49b6a0037

Companion Volume implementation guides are found in VETNet - https://vetnet.gov.au/Pages/TrainingDocs.aspx?q=26336bc0-04e5-49d9-8c31-46c49b6a0037

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Assessment Requirements for NWPGEN007 Sample and test drinking water

Modification History

Release	Comments
1	These Assessment Requirements were released in NWP Water Training Package release 1.0 and meet the Standards for Training Packages.

Performance Evidence

Evidence required to demonstrate competence must satisfy all of the requirements of the elements and performance criteria. To be deemed competent the candidate must be assessed in a minimum of three of the types of tests, one of the types of conditions and one of the areas of sampling listed in the Range of Conditions. If not otherwise specified the candidate must demonstrate evidence of performance of the following on at least one occasion.

- calibrating testing equipment
- interpreting sampling and testing requirements
- preparing, checking and using equipment
- assessing risks
- preparing, collecting, labelling and preserving water samples
- disposing of waste and spent samples
- planning and preparing for water sampling tasks
- recording all required information

Knowledge Evidence

Evidence required to demonstrate competence must satisfy all of the requirements of the elements and performance criteria. If not otherwise specified the depth of knowledge demonstrated must be appropriate to the job context of the candidate.

- chain of custody
- range and purpose of basic water quality testing and sampling
- relevant policies and procedures
- blind sampling
- abnormal characteristics of water samples
- atypical test result data
- relevant work-related calculations
- maintenance and storage of reagents
- requirements for maintaining sample integrity

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- relevant legislative and organisational requirements
- water sample preparation
- work planning processes
- effects of weather and conditions on work
- hazards associated with collection of water samples
- incident management principles

Assessment Conditions

Competency should be assessed in an actual workplace or in a simulated environment, with access to equipment and infrastructure appropriate to the outcome. Competency should be demonstrated over time to ensure the candidate is assessed across a variety of situations.

Assessors must satisfy the NVR/AQTF mandatory competency requirements for assessors.

Links

Companion Volume implementation guides are found in VETNet - https://vetnet.gov.au/Pages/TrainingDocs.aspx?q=26336bc0-04e5-49d9-8c31-46c49b6a0037

Companion Volume implementation guides are found in VETNet - https://vetnet.gov.au/Pages/TrainingDocs.aspx?q=26336bc0-04e5-49d9-8c31-46c49b6a0037

Companion Volume implementation guides are found in VETNet - https://vetnet.gov.au/Pages/TrainingDocs.aspx?q=26336bc0-04e5-49d9-8c31-46c49b6a0037

Companion Volume implementation guides are found in VETNet - https://vetnet.gov.au/Pages/TrainingDocs.aspx?q=26336bc0-04e5-49d9-8c31-46c49b6a0037

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NWPGEN008 Sample and test wastewater

Modification History

Release	Comments
1	This unit was released in NWP Water Training Package release 1.0 and meets the Standards for Training Packages. • New unit • Created drawing upon information from deleted units NWP210B and NWP218B

Application

This unit describes the skills required to collect and prepare wastewater samples and to perform basic wastewater tests. This unit does not include off-site laboratory testing.

This unit applies to those working in field operations within the water industry, but might be relevant to others.

The skills and knowledge described in this unit must be applied within the legislative, regulatory and policy environment in which they are carried out. Organisational policies and procedures must be consulted and adhered to.

Those undertaking this unit would work under supervision, while performing routine tasks in a range of familiar contexts.

No licensing, legislative or certification requirements apply to unit at the time of publication.

Competency Field

General

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Elements and Performance Criteria

ELEMENTS	PERFORMANCE CRITERIA
Elements describe the essential outcomes	Performance criteria describe the performance needed to demonstrate achievement of the element. Where bold italicised text is used, further information is detailed in the range of conditions section.
1. Prepare for wastewater sampling and testing	1.1 Receive instructions for taking samples and conducting basic water quality tests. 1.2 Confirm and record samples and tests to comply with requirements. 1.3 Select, check and prepare equipment and resources. 1.4 Select and apply relevant sample preservation methods. 1.5 Select, fit and use personal protective equipment.
2. Conduct wastewater sampling and testing	2.1 Adopt hygienic work practices. 2.2 Collect samples ensuring that types, locations and times comply with requirements. 2.3 Prepare samples for off-site laboratory testing according to requirements. 2.4 Maintain integrity of samples during sampling and on-site testing. 2.5 Conduct basic on-site wastewater tests. 2.6 Assess and report abnormal characteristics and apply incident management principles. 2.7 Record samples and results of on-site analysis. 2.8 Limit hazards and contamination to self, work area and environment.
3. Finalise work	3.1 Apply chain of custody principles. 3.2 Report observations or measurements requiring further action. 3.3 Dispose of samples and clean and store test equipment. 3.4 Clear and restore work area.

Foundation Skills

The foundation skills demands of this unit have been mapped for alignment with the Australian Core Skills Framework (ACSF). The following tables outline the performance levels indicated for successful attainment of the unit.

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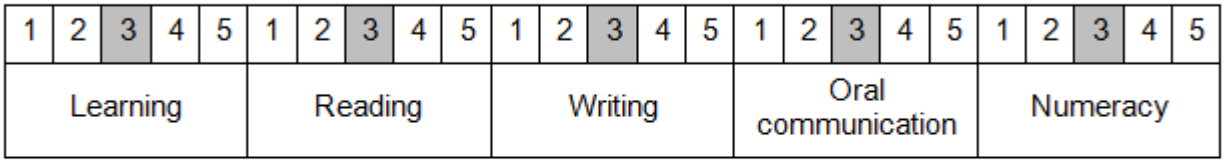
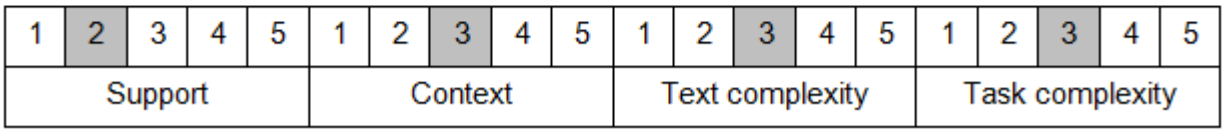
ACSF levels indicative of performance:



Performance variables:



Further information on ACSF and the foundation skills underpinning this unit can be found in the Foundation Skills Guide on the GSA website.

Range of Conditions

On-site test include:	• turbidity • pH • dissolved oxygen • electrical conductivity • temperature
Sampling conditions include:	• physical • microbial • chemical • radiological
Sampling methods include:	• automatic • manual

Unit Mapping Information

No equivalent unit.

Links

Companion Volume implementation guides are found in VETNet - https://vetnet.gov.au/Pages/TrainingDocs.aspx?q=26336bc0-04e5-49d9-8c31-46c49b6a0037

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Companion Volume implementation guides are found in VETNet - https://vetnet.gov.au/Pages/TrainingDocs.aspx?q=26336bc0-04e5-49d9-8c31-46c49b6a0037

Companion Volume implementation guides are found in VETNet - https://vetnet.gov.au/Pages/TrainingDocs.aspx?q=26336bc0-04e5-49d9-8c31-46c49b6a0037

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Assessment Requirements for NWPGEN008 Sample and test wastewater

Modification History

Release	Comments
1	These Assessment Requirements were released in NWP Water Training Package release 1.0 and meet the Standards for Training Packages.

Performance Evidence

Evidence required to demonstrate competence must satisfy all of the requirements of the elements and performance criteria. To be deemed competent the candidate must be assessed in a minimum of three of the types of tests, one of the types of condition and one of the types of methods listed in the Range of Conditions. If not otherwise specified the candidate must demonstrate evidence of performance of the following on at least one occasion.

- calibrating testing equipment
- interpreting sampling and testing requirements
- preparing, checking and using equipment
- preparing, collecting, labelling and preserving water samples
- disposing of waste and spent samples
- planning and preparing for water sampling tasks
- recording all required information

Knowledge Evidence

Evidence required to demonstrate competence must satisfy all of the requirements of the elements and performance criteria. If not otherwise specified the depth of knowledge demonstrated must be appropriate to the job context of the candidate.

Basic knowledge of:

- chain of custody
- range and purpose of basic wastewater testing and sampling
- relevant policies and procedures
- blind sampling
- abnormal characteristics of water samples
- atypical test result data
- relevant work-related calculations
- maintenance and storage of reagents

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- requirements for maintaining sample integrity
- relevant legislative and organisational requirements
- water sample preparation
- work planning processes
- effects of weather and conditions on work
- hazards associated with collection of water samples
- incident management principles

Assessment Conditions

Competency should be assessed in an actual workplace or in a simulated environment, with access to equipment and infrastructure appropriate to the outcome. Competency should be demonstrated over time to ensure the candidate is assessed across a variety of situations.

Assessors must satisfy the NVR/AQTF mandatory competency requirements for assessors.

Links

Companion Volume implementation guides are found in VETNet - https://vetnet.gov.au/Pages/TrainingDocs.aspx?q=26336bc0-04e5-49d9-8c31-46c49b6a0037

Companion Volume implementation guides are found in VETNet - https://vetnet.gov.au/Pages/TrainingDocs.aspx?q=26336bc0-04e5-49d9-8c31-46c49b6a0037

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Companion Volume implementation guides are found in VETNet - https://vetnet.gov.au/Pages/TrainingDocs.aspx?q=26336bc0-04e5-49d9-8c31-46c49b6a0037

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NWPGEN011 Use maps, plans, drawings and specifications

Modification History

Release	Comments
1	These Assessment Requirements were released in NWP Water Training Package release 1.0 and meet the Standards for Training Packages. • New unit • Created drawing upon information from deleted units NWP209B and NWP105B

Application

This unit describes the skills required to read and interpret maps, plans, drawings and specifications and prepare a simple map or plan.

This unit applies to those working in the water industry, but could be used by other sectors.

The skills and knowledge described in this unit must be applied within the legislative, regulatory and policy environment in which they are carried out. Organisational policies and procedures must be consulted and adhered to.

Those undertaking this unit would work under supervision, while performing routine tasks in a range of contexts.

No licensing, legislative or certification requirements apply to unit at the time of publication.

Competency Field

General

Elements and Performance Criteria

ELEMENTS	PERFORMANCE CRITERIA
Elements describe the	Performance criteria describe the performance needed to demonstrate

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essential outcomes	achievement of the element. Where bold italicised text is used, further information is detailed in the range of conditions section.
1. Interpret maps, plans, drawings and specifications	1.1 Identify types of maps, plans, drawings and specifications required to undertake work tasks. 1.2 Identify parts of the water system and their inter-relationship on a range of drawing types. 1.3 Interpret commonly used symbols and abbreviations. 1.4 Interpret and apply the function of the legend. 1.5 Verify latest version. 1.6 Identify natural and man-made features on maps, plans and drawings. 1.7 Relate specifications to maps, plans and drawings and identify quality standards. 1.8 Identify types of details from works specifications.
2. Use maps, plans drawings and specifications	2.1 Use organisation system to access maps plans, drawings and specifications. 2.2 Translate technical data and apply quality standards into work site environment. 2.3 Calculate distances using maps and plans with a range of scales. 2.4 Confirm orientation, boundaries and identified features of the site. 2.5 Identify any errors in the maps, plans, drawings and specifications.
3. Record and advise on changes and errors	3.1 Draw or amend a map or plan. 3.2 Take actual measurements and record features on a map or drawing. 3.3 Record and report amendments.

Foundation Skills

The foundation skills demands of this unit have been mapped for alignment with the Australian Core Skills Framework (ACSF). The following tables outline the performance levels indicated for successful attainment of the unit.

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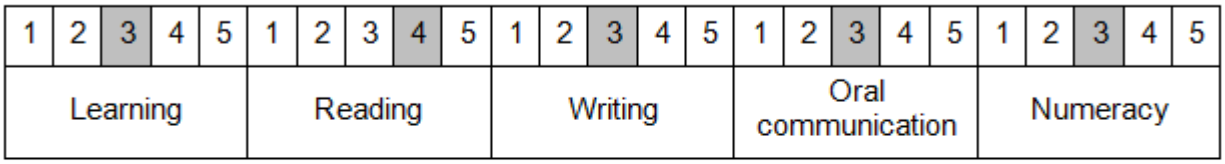
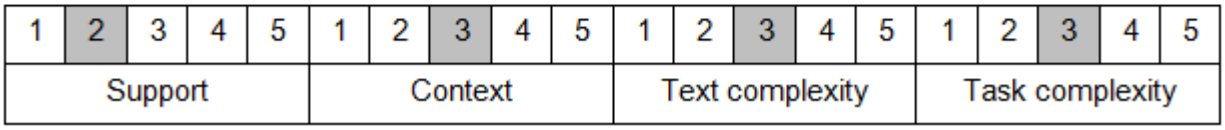
ACSF levels indicative of performance:



Performance variables:



Further information on ACSF and the foundation skills underpinning this unit can be found in the Foundation Skills Guide on the GSA website.

Unit Mapping Information

No equivalent unit.

Links

Companion Volume implementation guides are found in VETNet - https://vetnet.gov.au/Pages/TrainingDocs.aspx?q=26336bc0-04e5-49d9-8c31-46c49b6a0037

Companion Volume implementation guides are found in VETNet - https://vetnet.gov.au/Pages/TrainingDocs.aspx?q=26336bc0-04e5-49d9-8c31-46c49b6a0037

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Assessment Requirements for NWPGEN011 Use maps, plans, drawings and specifications

Modification History

Release	Comments
1	These Assessment Requirements were released in NWP Water Training Package release 1.0 and meet the Standards for Training Packages.

Performance Evidence

Evidence required to demonstrate competence must satisfy all of the requirements of the elements and performance criteria. If not otherwise specified the candidate must demonstrate evidence of performance of the following on at least one occasion.

- locating maps, plans, drawings and specifications for work tasks
- locating work sites
- using information provided in maps, plans and drawings to complete a task
- preparing a simple map or plan that represents an actual or simulated work environment
- applying problem solving strategies

Knowledge Evidence

Evidence required to demonstrate competence must satisfy all of the requirements of the elements and performance criteria. If not otherwise specified the depth of knowledge demonstrated must be appropriate to the job context of the candidate.

Basic knowledge of:

- the range of maps, plans and drawings to different assignment situations
- basic formulae of volumes, area and mass
- features of maps, plans and drawings including:
  - contours
  - datum points
  - planes
  - gradients
  - sections
  - orthographic projections
  - symbols
  - dimensions

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- terminology

Assessment Conditions

Competency should be assessed in an actual workplace or in a simulated environment, with access to equipment and infrastructure appropriate to the outcome. Competency should be demonstrated over time to ensure the candidate is assessed across a variety of situations.

Assessors must satisfy the NVR/AQTF mandatory competency requirements for assessors.

Links

Companion Volume implementation guides are found in VETNet - https://vetnet.gov.au/Pages/TrainingDocs.aspx?q=26336bc0-04e5-49d9-8c31-46c49b6a0037

Companion Volume implementation guides are found in VETNet - https://vetnet.gov.au/Pages/TrainingDocs.aspx?q=26336bc0-04e5-49d9-8c31-46c49b6a0037

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NWPNET002 Prepare and restore work site

Modification History

Release	Comments
1	This unit was released in NWP Water Training Package release 1.0 and meets the Standards for Training Packages. This unit supersedes and is equivalent to NWP226B Prepare and restore work site. • Unit code updated • Content and formatting updated to comply with the new standards • All PC transitioned from passive to active voice • PC 3.1 removed • PC 2.3 and 2.4 merged

Application

This unit describes the skills required to prepare work sites. The ability to follow work instructions, use a range of equipment and tools to prepare a safe work site and subsequently to restore the site to the required condition is essential to satisfactory performance.

This unit applies to those working as field and operational staff performing a wide range of functions that support construction, maintenance and operations processes.

The skills and knowledge described in this unit must be applied within the legislative, regulatory and policy environment in which they are carried out. Organisational policies and procedures must be consulted and adhered to, particularly those related to WHS and manufacturer specifications.

Those undertaking this unit would work under supervision, performing routine tasks, in mostly familiar contexts.

No licensing, legislative or certification requirements apply to unit at the time of publication.

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Competency Field

Networks

Elements and Performance Criteria

ELEMENTS	PERFORMANCE CRITERIA
Elements describe the essential outcomes	Performance criteria describe the performance needed to demonstrate achievement of the element. Where bold italicised text is used, further information is detailed in the range of conditions section.
1. Plan and prepare for work	1.1 Determine site preparation requirements from specifications, instructions and pre-work inspections. 1.2 Identify and report potential hazards to public and environment and assess risks. 1.3 Perform a site check according to legislative and organisational requirements to identify risks and prevent damage to other utilities. 1.4 Select and check work site equipment, tools and materials as appropriate to meet task and safety specifications. 1.5 Select, fit and use personal protective equipment.
2. Prepare work site	2.1 Position safety equipment and materials to prevent potential risks to public and environment. 2.2 Store and secure equipment and materials. 2.3 Use work site equipment, manual or mechanical excavation equipment, tools and materials. 2.4 Provide appropriate drainage and diversion of site inflows from work site without damage to environment.
3. Restore work site	3.1 Backfill and compact excavations according to specifications. 3.2 Remove excess soil, debris and unwanted materials from site. 3.3 Restore work site to meet environmental and organisational requirements using equipment, tools and materials.
4. Review, record and report activities	4.1 Check, maintain and store equipment, tools and materials. 4.2 Maintain workplace records.

Foundation Skills

The foundation skills demands of this unit have been mapped for alignment with the Australian Core Skills Framework (ACSF). The following tables outline the performance levels indicated for successful attainment of the unit.

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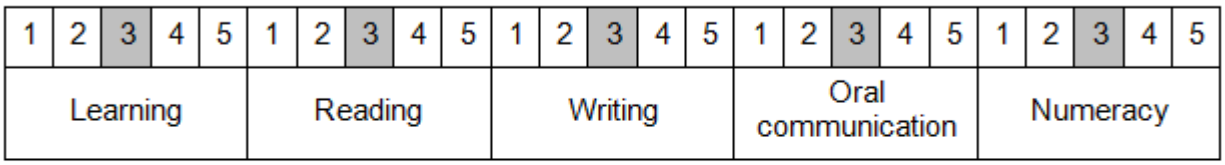
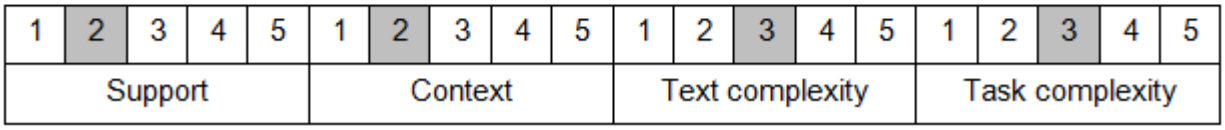
ACSF levels indicative of performance:



Performance variables:



Further information on ACSF and the foundation skills underpinning this unit can be found in the Foundation Skills Guide on the GSA website.

Unit Mapping Information

This unit supersedes and is equivalent to NWP226B Prepare and restore work site.

Links

Companion Volume implementation guides are found in VETNet - https://vetnet.gov.au/Pages/TrainingDocs.aspx?q=26336bc0-04e5-49d9-8c31-46c49b6a0037

Companion Volume implementation guides are found in VETNet - https://vetnet.gov.au/Pages/TrainingDocs.aspx?q=26336bc0-04e5-49d9-8c31-46c49b6a0037

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Assessment Requirements for NWPNET002 Prepare and restore work site

Modification History

Release	Comments
1	These Assessment Requirements were released in NWP Water Training Package release 1.0 and meet the Standards for Training Packages. • Assessment Requirements created drawing upon specified assessment information from superseded unit

Performance Evidence

Evidence required to demonstrate competence must satisfy all of the requirements of the elements and performance criteria. If not otherwise specified the candidate must demonstrate evidence of performance of the following on at least one occasion.

- setting up compacting and reinstating a site
- interpreting and applying numerical data in specifications and plans
- excavating backfill
- preparing site for planting and plant vegetation
- interpreting plans, instructions, standard operating procedures and work requirements
- using tools and equipment
- identifying and responding to operational problems
- planning work site layout
- selecting, using, maintaining, cleaning, storing and securing materials and equipment
- clearing and preparing work site according to specifications
- restoring work site
- cleaning, maintaining and storing equipment

Knowledge Evidence

Evidence required to demonstrate competence must satisfy all of the requirements of the elements and performance criteria. If not otherwise specified the depth of knowledge demonstrated must be appropriate to the job context of the candidate.

- WHS
- risk factors and potential hazards of site preparation and restoration
- environmental aspects of site preparation and restoration

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- trenching, shoring and excavation management
- excavation procedures and site restoration
- relevant utilities and service bodies
- communication systems
- landscape and ground structure of work area
- equipment operation, capacity and limitations
- effects of weather and conditions on construction site or plant

Assessment Conditions

Competency should be assessed in an actual workplace or in a simulated environment, with access to equipment and infrastructure appropriate to the outcome. Competency should be demonstrated over time to ensure the candidate is assessed across a variety of situations.

Assessors must satisfy the NVR/AQTF mandatory competency requirements for assessors.

Links

Companion Volume implementation guides are found in VETNet - https://vetnet.gov.au/Pages/TrainingDocs.aspx?q=26336bc0-04e5-49d9-8c31-46c49b6a0037

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Companion Volume implementation guides are found in VETNet - https://vetnet.gov.au/Pages/TrainingDocs.aspx?q=26336bc0-04e5-49d9-8c31-46c49b6a0037

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NWPNET023 Maintain and repair network assets for wastewater

Modification History

Release	Comments
1	This unit was released in NWP Water Training Package release 1.0 and meets the Standards for Training Packages. • New unit, created drawing upon information from deleted units NWP255B, NWP257B, NWP253B and NWP229B

Application

This unit describes the skills required to maintain and repair pipes, drains and wastewater collection assets.

This unit applies to those working as field staff with specific responsibility for ensuring that repair and maintenance of wastewater assets is completed in a safe and timely manner.

The skills and knowledge described in this unit must be applied within the legislative, regulatory and policy environment in which they are carried out. Organisational policies and procedures must be consulted and adhered to.

Those undertaking this unit would work under indirect supervision, while performing routine tasks, in a familiar context, ensuring minimum damage to the environment.

No licensing, legislative or certification requirements apply to unit at the time of publication.

Competency Field

Networks

Elements and Performance Criteria

ELEMENTS	PERFORMANCE CRITERIA
Elements describe	Performance criteria describe the performance needed to demonstrate

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the essential outcomes	achievement of the element. Where bold italicised text is used, further information is detailed in the range of conditions section.
1. Plan and prepare for work	1.1 Conduct risk assessment for environmental and safety factors. 1.2 Determine work requirements, materials and configuration from plans, specifications, instructions and/or organisational procedures. 1.3 Check coordination issues with relevant personnel, including isolations, licences and permits to work. 1.4 Identify networks system operation requirements. 1.5 Arrange remove site protection.
2. Conduct maintenance	2.1 Isolate the work area. 2.2 Determine appropriate repair method from job specifications and instructions. 2.3 Maintain and repair structural damage to assets. 2.4 Check maintenance and repairs to assets to ensure specifications are met. 2.5 Restore work site to meet environmental and organisational requirements.
3. Review, report and record work	3.1 Check, tag and report faulty equipment and tools. 3.2 Store equipment, tools and materials. 3.3 Complete and process workplace records.

Foundation Skills

The foundation skills demands of this unit have been mapped for alignment with the Australian Core Skills Framework (ACSF). The following tables outline the performance levels indicated for successful attainment of the unit.

ACSF levels indicative of performance:

1	2	3	4	5	1	2	3	4	5	1	2	3	4	5	1	2	3	4	5	1	2	3	4	5
Learning					Reading					Writing					Oral communication					Numeracy					

Performance variables:

1	2	3	4	5	1	2	3	4	5	1	2	3	4	5	1	2	3	4	5
Support					Context					Text complexity					Task complexity				

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Further information on ACSF and the foundation skills underpinning this unit can be found in the Foundation Skills Guide on the GSA website.

Range of Conditions

Network assets includes:	• water mains • connections • pump stations

Unit Mapping Information

No equivalent unit.

Links

Companion Volume implementation guides are found in VETNet - https://vetnet.gov.au/Pages/TrainingDocs.aspx?q=26336bc0-04e5-49d9-8c31-46c49b6a0037

Companion Volume implementation guides are found in VETNet - https://vetnet.gov.au/Pages/TrainingDocs.aspx?q=26336bc0-04e5-49d9-8c31-46c49b6a0037

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Assessment Requirements for NWPNET023 Maintain and repair network assets for wastewater

Modification History

Release	Comments
1	These Assessment Requirements were released in NWP Water Training Package release 1.0 and meet the Standards for Training Packages.

Performance Evidence

Evidence required to demonstrate competence must satisfy all of the requirements of the elements and performance criteria. The candidate must be assessed on at least two of the network assets listed in the Range of Conditions. If not otherwise specified the candidate must demonstrate evidence of performance of the following on at least one occasion.

- planning work site i.e. personnel, equipment, materials
- requesting permits, approvals, other utilities diagrams and maps
- conducting risk implementing appropriate environmental controls
- using tools and specific wastewater equipment
- selecting and applying PPE
- preserving personal safety
- performing work-related calculations
- identifying and responding to operational problems including main, connection chokes, pump stations and faults
- using communication tools including phones and laptops
- interpreting plans, instructions and procedures
- determining location, size, utilities, services from plans, specifications and organisational procedures
- applying excavation techniques
- maintaining and repairing wastewater pipes and fittings by:
  - undertaking excavation
  - clearing chokes
  - undertaking CCTV inspection for roots intrusion, storm water ingress and infiltration
  - jet foaming
  - jet cleaning
  - installing connections
  - installing pipes and fittings
  - measuring and cutting pipes
  - making joints

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  - selecting and placing bedding and backfill material
  - locating and repairing chokes
  - repairing valves
  - controlling flows in gravity networks
- maintaining and repairing structures by:
  - undertaking excavation
  - repairing access chambers
  - maintaining pump stations

Knowledge Evidence

Evidence required to demonstrate competence must satisfy all of the requirements of the elements and performance criteria. If not otherwise specified the depth of knowledge demonstrated must be appropriate to the job context of the candidate.

- system hydraulics basics
- infiltration
- roots intrusion
- storm water ingress
- excavation techniques
- ground support systems
- environmental and health aspects and impacts
- relevant legislation, policies and procedures
- safety data sheets (SDS)
- landscape and ground structure of work area
- equipment operation, capacity and limitations
- control systems
- pipe systems and installation requirements
- characteristics of pipe materials
- testing and sampling systems
- methods of repairing concrete, brick and stone structures
- concrete placement techniques, including compaction
- relevant utilities and service bodies to identify allocation of road reserve
- effects of weather and conditions on construction site or plant
- requirements around excavation
- Cathodic Protection, Denso wrap, Stopaq

Assessment Conditions

Competency should be assessed in an actual workplace or in a simulated environment, with access to equipment and infrastructure appropriate to the outcome. Competency should be demonstrated over time to ensure the candidate is assessed across a variety of situations.

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Assessors must satisfy the NVR/AQTF mandatory competency requirements for assessors.

Links

Companion Volume implementation guides are found in VETNet - https://vetnet.gov.au/Pages/TrainingDocs.aspx?q=26336bc0-04e5-49d9-8c31-46c49b6a0037

Companion Volume implementation guides are found in VETNet - https://vetnet.gov.au/Pages/TrainingDocs.aspx?q=26336bc0-04e5-49d9-8c31-46c49b6a0037

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NWPNET041 Monitor and operate water distribution systems

Modification History

Release	Comments
1	This unit was released in NWP Water Training Package release 1.0 and meets the Standards for Training Packages. This unit supersedes and is equivalent to NWP310B Monitor and operate water distribution systems. • Unit code updated • Content and formatting updated to comply with the new standards • All PC transitioned from passive to active voice

Application

This unit of competency describes the skills required to monitor and coordinate the operation of bulkwater or water distribution systems and to measure and report on the operation of the system. The ability to interpret technical documentation, identify and investigate operational problems and to collect and analyse technical information is essential to performance.

This unit applies to those working as field staff and operators with a specific responsibility for inspecting and measuring the performance of bulkwater or water distribution systems and for ensuring that flow, pressure and volume parameters are regulated according to organisational specifications and system demands.

The skills and knowledge described in this unit must be applied within the legislative, regulatory and policy environment in which they are carried out. Organisational policies and procedures must be consulted and adhered to, particularly those related to WHS.

Those undertaking this unit would work under indirect supervision, while performing routine tasks, in a familiar context, ensuring minimum damage to the environment.

No licensing, legislative or certification requirements apply to unit at the time of publication.

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Competency Field

Networks

Elements and Performance Criteria

ELEMENTS	PERFORMANCE CRITERIA
Elements describe the essential outcomes	Performance criteria describe the performance needed to demonstrate achievement of the element. Where bold italicised text is used, further information is detailed in the range of conditions section.
1. Monitor system performance and usage	1.1 Select and check equipment required for monitoring system performance. 1.2 Schedule and conduct routine inspections and report any identified faults. 1.3 Collect, analyse and report system performance data. 1.4 Monitor sample collection and records.
2. Regulate flow, pressure and volume	2.1 Inspect and adjust flow regulating systems. 2.2 Monitor and adjust pressures and volumes. 2.3 Monitor flows and diversions required for repair or emergency activities.
3. Operate and control distribution processes	3.1 Control distribution processes to maintain the required parameters of operation. 3.2 Conduct flow measurements. 3.3 Identify, address and report process faults. 3.4 Optimise process performance.
4. Compile process reports	4.1 Compile reports from system data. 4.2 Record the condition of equipment and report faults or anticipated problems.

Foundation Skills

The foundation skills demands of this unit have been mapped for alignment with the Australian Core Skills Framework (ACSF). The following tables outline the performance levels indicated for successful attainment of the unit.

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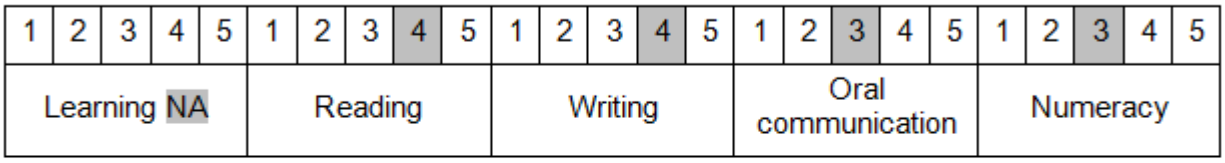
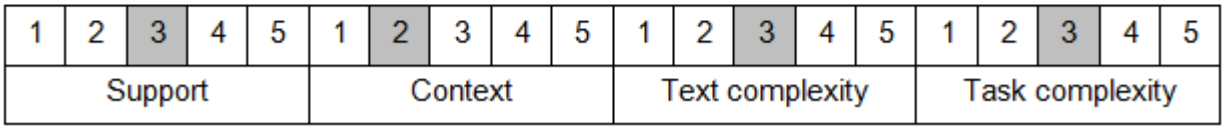
ACSF levels indicative of performance:



Performance variables:



Further information on ACSF and the foundation skills underpinning this unit can be found in the Foundation Skills Guide on the GSA website.

Unit Mapping Information

This unit supersedes and is equivalent to NWP310B Monitor and operate water distribution systems.

Links

Companion Volume implementation guides are found in VETNet - https://vetnet.gov.au/Pages/TrainingDocs.aspx?q=26336bc0-04e5-49d9-8c31-46c49b6a0037

Companion Volume implementation guides are found in VETNet - https://vetnet.gov.au/Pages/TrainingDocs.aspx?q=26336bc0-04e5-49d9-8c31-46c49b6a0037

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Companion Volume implementation guides are found in VETNet - https://vetnet.gov.au/Pages/TrainingDocs.aspx?q=26336bc0-04e5-49d9-8c31-46c49b6a0037

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Assessment Requirements for NWPNET041 Monitor and operate water distribution systems

Modification History

Release	Comments
1	These Assessment Requirements were released in NWP Water Training Package release 1.0 and meet the Standards for Training Packages. • Assessment Requirements created drawing upon specified assessment information from superseded unit

Performance Evidence

Evidence required to demonstrate competence must satisfy all of the requirements of the elements and performance criteria. If not otherwise specified the candidate must demonstrate evidence of performance of the following on at least one occasion.

- responding to and correcting operational problems
- interpreting plans, charts, service search diagrams, instructions, policies and specifications
- controlling system operations
- identifying control system faults
- monitoring and coordinating the operation of bulkwater or water distribution systems
- interpreting a range of technical documentation
- identifying and investigating operational problems
- collecting and analysing technical information
- conducting routine inspections
- analysing and reporting system performance data
- meeting organisation standards for optimising water distribution performance

Knowledge Evidence

Evidence required to demonstrate competence must satisfy all of the requirements of the elements and performance criteria. If not otherwise specified the depth of knowledge demonstrated must be appropriate to the job context of the candidate.

- system hydraulics
- coordination and control of processes
- system layout and processes
- environmental aspects of bulkwater and water distribution systems
- chemical use

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- policies, standard operating procedures and legislation
- relevant utilities and service bodies
- communication systems
- risk management principles
- risk factors and potential hazards involved with water pressures and flows
- equipment operation, capacity and limitations
- effects of weather and conditions on operation of bulkwater and water distribution systems
- types of pipes and fittings
- pumping and valving systems
- control systems
- forces including gravitational, valve operation, hydraulic and pumps

Assessment Conditions

Competency should be assessed in an actual workplace or in a simulated environment, with access to equipment and infrastructure appropriate to the outcome. Competency should be demonstrated over time to ensure the candidate is assessed across a variety of situations.

Assessors must satisfy the NVR/AQTF mandatory competency requirements for assessors.

Links

Companion Volume implementation guides are found in VETNet - https://vetnet.gov.au/Pages/TrainingDocs.aspx?q=26336bc0-04e5-49d9-8c31-46c49b6a0037

Companion Volume implementation guides are found in VETNet - https://vetnet.gov.au/Pages/TrainingDocs.aspx?q=26336bc0-04e5-49d9-8c31-46c49b6a0037

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Companion Volume implementation guides are found in VETNet - https://vetnet.gov.au/Pages/TrainingDocs.aspx?q=26336bc0-04e5-49d9-8c31-46c49b6a0037

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NWPSOU002 Control vegetation on a site

Modification History

Release	Comments
1	This unit was released in NWP Water Training Package release 1.0 and meets the Standards for Training Packages. This unit supersedes and is equivalent to NWP227B Control vegetation on a site. • Unit code updated • Content and formatting updated to comply with the new standards • All PC transitioned from passive to active voice

Application

This unit describes the skills required to control vegetation on a site by inspecting, identifying and treating weeds, plants and shrubs. The ability to plan and undertake work safely, including the safe handling of chemicals and equipment, is essential to performance.

This unit applies to those working as field and operational staff involved in plant control, but it does not reflect the requirements for undertaking plant control on the properties of third parties where further training and licensing requirements may apply.

The skills and knowledge described in this unit must be applied within the legislative, regulatory and policy environment in which they are carried out. Organisational policies and procedures must be consulted and adhered to.

Those undertaking this unit would work under supervision, while performing routine tasks, in familiar context.

No licensing, legislative or certification requirements apply to unit at the time of publication.

Competency Field

Source

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Elements and Performance Criteria

ELEMENTS	PERFORMANCE CRITERIA
Elements describe the essential outcomes	Performance criteria describe the performance needed to demonstrate achievement of the element. Where bold italicised text is used, further information is detailed in the range of conditions section.
1. Plan and prepare work	1.1 Organise tasks according to job specifications, relevant legislation and organisational procedures. 1.2 Perform site check to prevent damage to other utilities and environment. 1.3 Select and check equipment, personal protective equipment and material safety data sheets to meet safety requirements of task and site. 1.4 Identify noxious weeds, plants and shrubs.
2. Treat vegetation	2.1 Conduct monitoring programs to determine spread, growth rate and extent of problem caused by weeds. 2.2 Store, handle, transport and mix chemicals and other control mechanisms. 2.3 Use processes to treat vegetation. 2.4 Implement controls to minimise environmental damage and deal with emergencies and spillage.
3. Check work and restore work site	3.1 Clean equipment after use and prepare for safe storage or re-use. 3.2 Identify potential hazards and dispose of waste.
4. Complete records and reports	4.1 Record use of chemicals and control mechanisms. 4.2 Complete work reports and documentation.

Foundation Skills

The foundation skills demands of this unit have been mapped for alignment with the Australian Core Skills Framework (ACSF). The following tables outline the performance levels indicated for successful attainment of the unit.

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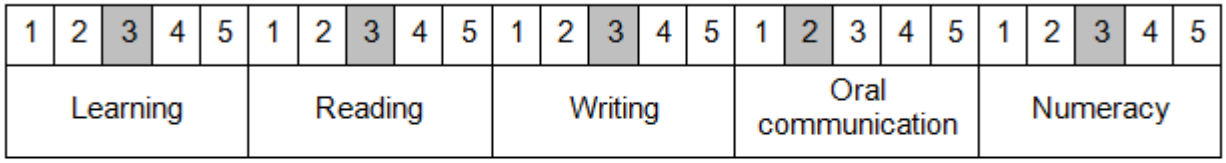
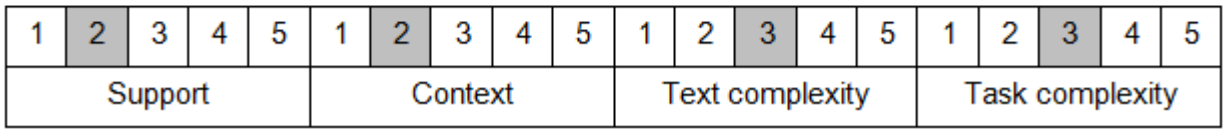
ACSF levels indicative of performance:



Performance variables:



Further information on ACSF and the foundation skills underpinning this unit can be found in the Foundation Skills Guide on the GSA website.

Unit Mapping Information

This unit supersedes and is equivalent to NWP227B Control vegetation on a site.

Links

Companion Volume implementation guides are found in VETNet - https://vetnet.gov.au/Pages/TrainingDocs.aspx?q=26336bc0-04e5-49d9-8c31-46c49b6a0037

Companion Volume implementation guides are found in VETNet - https://vetnet.gov.au/Pages/TrainingDocs.aspx?q=26336bc0-04e5-49d9-8c31-46c49b6a0037

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Assessment Requirements for NWPSOU002 Control vegetation on a site

Modification History

Release	Comments
1	These Assessment Requirements were released in NWP Water Training Package release 1.0 and meet the Standards for Training Packages. • Assessment Requirements created drawing upon specified assessment information from superseded unit

Performance Evidence

Evidence required to demonstrate competence must satisfy all of the requirements of the elements and performance criteria. If not otherwise specified the candidate must demonstrate evidence of performance of the following on at least one occasion.

- identifying and reporting operational problems
- producing reports and logs and completing relevant documentation
- using personal protective equipment, tools and machinery, chemicals and other treatments
- following plans, charts and instructions
- performing work-related calculations
- interpreting material safety data sheets (MSDS)
- applying procedures and standards
- controlling vegetation on a site by inspecting, identifying and treating weeds, plants and shrubs
- interpreting work requirements from given documentation
- identifying noxious weeds and appropriate control methods
- planning and preparing equipment and materials required for work
- identifying risks and implementing controls
- restoring work site

Knowledge Evidence

Evidence required to demonstrate competence must satisfy all of the requirements of the elements and performance criteria. If not otherwise specified the depth of knowledge demonstrated must be appropriate to the job context of the candidate.

- environmental aspects of controlling vegetation
- relevant utilities and service bodies

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- communication systems
- use, storage, handling and transport of hazardous substances
- landscape and ground structure of work area
- risk factors and potential hazards of vegetation control processes
- equipment operation, capacity and limitations
- effects of weather and conditions on use of chemical treatment, site or plant
- control systems
- materials handling
- landscape and ground structure of work area

Assessment Conditions

Competency should be assessed in an actual workplace or in a simulated environment, with access to equipment and infrastructure appropriate to the outcome. Competency should be demonstrated over time to ensure the candidate is assessed across a variety of situations.

Assessors must satisfy the NVR/AQTF mandatory competency requirements for assessors.

Links

Companion Volume implementation guides are found in VETNet - https://vetnet.gov.au/Pages/TrainingDocs.aspx?q=26336bc0-04e5-49d9-8c31-46c49b6a0037

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NWPSOU011 Maintain catchment and surrounding areas

Modification History

Release	Comments
1	This unit was released in NWP Water Training Package release 1.0 and meets the Standards for Training Packages. This unit supersedes and is equivalent to NWP247A Maintain catchment and surrounding areas. • Unit code updated • Content and formatting updated to comply with the new standards • All PC transitioned from passive to active voice • PC 3.2 reworded

Application

This unit of competency describes the skills required to maintain surface catchment areas and associated rivers, lakes, water bodies, dams, water storages and groundwater areas in a manner that meets organisational standards and contributes to the maintenance of water quality, and the protection of the environment and the public. The ability to maintain environmental conditions, undertake maintenance and report outcomes is essential to performance.

This unit applies to those working as field staff with specific responsibility for maintaining catchment and surrounding areas and contributing to catchment management and control.

The skills and knowledge described in this unit must be applied within the legislative, regulatory and policy environment in which they are carried out. Organisational policies and procedures must be consulted and adhered to, particularly those related to WHS, catchment security and catchment emergency response.

Those undertaking this unit would work independently or in a team, while performing routine tasks in range of familiar contexts.

No licensing, legislative or certification requirements apply to unit at the time of publication.

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Competency Field

Source

Elements and Performance Criteria

ELEMENTS	PERFORMANCE CRITERIA
Elements describe the essential outcomes	Performance criteria describe the performance needed to demonstrate achievement of the element. Where bold italicised text is used, further information is detailed in the range of conditions section.
1. Prepare for work	1.1 Access and review catchment inspection records describing maintenance requirements for action. 1.2 Identify and apply work requirements and timelines for performing maintenance tasks of catchments and surrounding areas. 1.3 Assess site, equipment and methods to be used for risks and apply appropriate control measures. 1.4 Plan maintenance work to be conducted within required timeframe, using allocated resources.
2. Maintain environmental condition of waterways and surrounding areas	2.1 Remove and dispose of dead livestock or native fauna from waterways and surrounding catchments. 2.2 Remove flood debris from waterways and surrounding areas. 2.3 Carry out fuel reduction burns. 2.4 Apply basic control measures to contain or control chemical spills or contaminated water supplies. 2.5 Identify and report potential or emerging changes to environmental conditions.
3. Eradicate noxious weeds and feral pests	3.1 Identify noxious weeds and feral pests that are contributing to degradation of catchment and surrounding areas. 3.2 Remove noxious weeds and feral pests. 3.3 Compile reports on eradication process.
4. Perform minor maintenance	4.1 Identify infrastructure requiring minor maintenance. 4.2 Apply erosion control measures for waterways and surrounding areas. 4.3 Make repairs using appropriate equipment and resources to a standard that meets organisational requirements. 4.4 Record and report maintenance performed.

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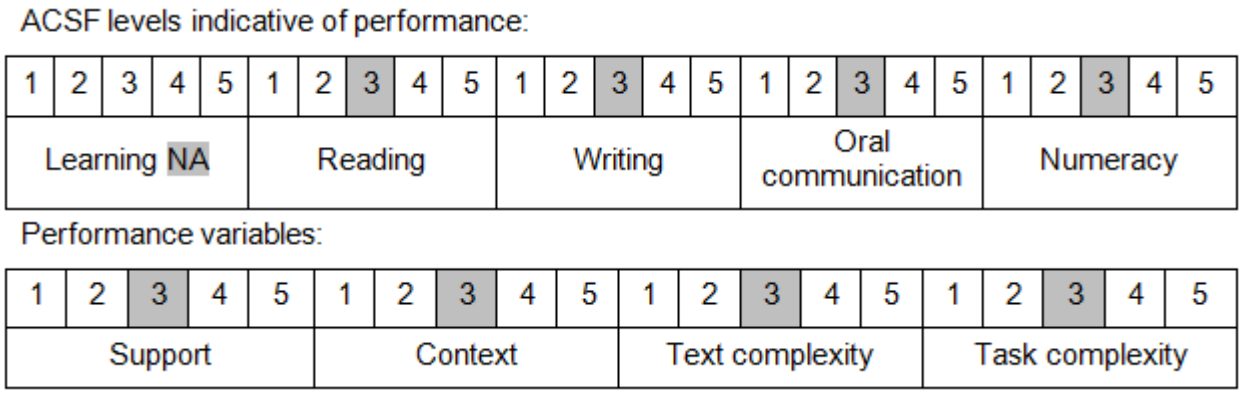
Foundation Skills

The foundation skills demands of this unit have been mapped for alignment with the Australian Core Skills Framework (ACSF). The following tables outline the performance levels indicated for successful attainment of the unit.



Further information on ACSF and the foundation skills underpinning this unit can be found in the Foundation Skills Guide on the GSA website.

Unit Mapping Information

This unit supersedes and is equivalent to NWP247A Maintain catchment and surrounding areas.

Links

Companion Volume implementation guides are found in VETNet - https://vetnet.gov.au/Pages/TrainingDocs.aspx?q=26336bc0-04e5-49d9-8c31-46c49b6a0037

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Assessment Requirements for NWPSOU011 Maintain catchment and surrounding areas

Modification History

Release	Comments
1	These Assessment Requirements were released in NWP Water Training Package release 1.0 and meet the Standards for Training Packages. • Assessment Requirements created drawing upon specified assessment information from superseded unit

Performance Evidence

Evidence required to demonstrate competence must satisfy all of the requirements of the elements and performance criteria. If not otherwise specified the candidate must demonstrate evidence of performance of the following on at least one occasion.

- undertaking inspections of catchment and surrounds
- identifying and responding to maintenance problems
- maintaining surface catchment areas
- interpreting work requirements
- monitoring and reporting environmental conditions
- maintaining catchment areas and removing debris and noxious weeds and pests
- performing minor maintenance tasks
- compiling reports

Knowledge Evidence

Evidence required to demonstrate competence must satisfy all of the requirements of the elements and performance criteria. If not otherwise specified the depth of knowledge demonstrated must be appropriate to the job context of the candidate.

- environmental, landscape and ground structure of work area
- risk factors and potential hazards of surface water systems
- catchment emergency response and catchment security procedures
- effects of weather and conditions on operation of site or plant

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Assessment Conditions

Competency should be assessed in an actual workplace or in a simulated environment, with access to equipment and infrastructure appropriate to the outcome. Competency should be demonstrated over time to ensure the candidate is assessed across a variety of situations.

Assessors must satisfy the NVR/AQTF mandatory competency requirements for assessors.

Links

Companion Volume implementation guides are found in VETNet - https://vetnet.gov.au/Pages/TrainingDocs.aspx?q=26336bc0-04e5-49d9-8c31-46c49b6a0037

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NWPSOU022 Monitor and control dam operations

Modification History

Release	Comments
1	This unit was released in NWP Water Training Package release 1.0 and meets the Standards for Training Packages. This unit supersedes and is equivalent to NWP319A Monitor and control dam operations. • Unit code updated • Content and formatting updated to comply with the new standards • All PC transitioned from passive to active voice • PC 1.2 and 1.3 removed • One new PC added to Element 1

Application

This unit describes the skills required to prepare for and implement dam operation plans, including inspection and testing of dam safety mechanisms.

This unit applies to those working as field and operational staff with a specific responsibility for the operation of ungated dams.

The skills and knowledge described in this unit must be applied within the legislative, regulatory and policy environment in which they are carried out. Organisational policies and procedures must be consulted and adhered to.

Those undertaking this unit would work under supervision while performing routine tasks in a limited range of familiar contexts.

No licensing, legislative or certification requirements apply to unit at the time of publication.

Competency Field

Source

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Elements and Performance Criteria

ELEMENTS	PERFORMANCE CRITERIA
Elements describe the essential outcomes	Performance criteria describe the performance needed to demonstrate achievement of the element. Where bold italicised text is used, further information is detailed in the range of conditions section.
1. Plan and prepare for dam operation	1.1 Check and apply guidelines and regulatory requirements for dam operation to operation plans. 1.2 Prepare for dam operations.
2. Implement dam operation plans	2.1 Follow dam operation plans. 2.2 Inspect and test plant and equipment. 2.3 Test and record dam safety mechanisms.
3. Compile and process operation reports	3.1 Collect operational data from measurement instruments, inspections and team members. 3.2 Process, evaluate, validate, record and store operational data. 3.3 Record and report structural, material and/or equipment problems. 3.4 Recommend remedial action.

Foundation Skills

The foundation skills demands of this unit have been mapped for alignment with the Australian Core Skills Framework (ACSF). The following tables outline the performance levels indicated for successful attainment of the unit.

ACSF levels indicative of performance:

1 2 3 4 5	1 2 3 4 5	1 2 3 4 5	1 2 3 4 5	1 2 3 4 5
Learning NA	Reading	Writing	Oral communication	Numeracy

Performance variables:

1 2 3 4 5	1 2 3 4 5	1 2 3 4 5	1 2 3 4 5
Support	Context	Text complexity	Task complexity

Further information on ACSF and the foundation skills underpinning this unit can be found in the Foundation Skills Guide on the GSA website.

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Unit Mapping Information

This unit supersedes and is equivalent to NWP319A Monitor and control dam operations.

Links

Companion Volume implementation guides are found in VETNet - https://vetnet.gov.au/Pages/TrainingDocs.aspx?q=26336bc0-04e5-49d9-8c31-46c49b6a0037

Companion Volume implementation guides are found in VETNet - https://vetnet.gov.au/Pages/TrainingDocs.aspx?q=26336bc0-04e5-49d9-8c31-46c49b6a0037

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Assessment Requirements for NWPSOU022 Monitor and control dam operations

Modification History

Release	Comments
1	These Assessment Requirements were released in NWP Water Training Package release 1.0 and meet the Standards for Training Packages. • Assessment Requirements created drawing upon specified assessment information from superseded unit

Performance Evidence

Evidence required to demonstrate competence must satisfy all of the requirements of the elements and performance criteria. If not otherwise specified the candidate must demonstrate evidence of performance of the following on at least one occasion.

- identifying and investigating operational, access or security problems
- conducting inspections
- implementing operational activities
- interpreting plans, drawings, instructions, standard operating procedures, policies and standards
- using equipment, tools, machinery and personal protective equipment
- identifying safety hazards
- preparing for and implementing dam operation plans
- operating dams
- interpreting technical documentation
- collecting and analysing technical information
- preparing required reports

Knowledge Evidence

Evidence required to demonstrate competence must satisfy all of the requirements of the elements and performance criteria. If not otherwise specified the depth of knowledge demonstrated must be appropriate to the job context of the candidate.

- properties of stored water
- basic dam design principles
- risks to dams
- lessons from dam incidents

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- dam safety emergency operations
- dam security issues
- dam access issues
- dam operation principles
- basic materials science
- communication systems
- basic principles of hydraulics
- system layout
- environmental aspects of operation and maintenance
- lock out procedures for mechanical and electrical installations
- control systems
- equipment operation
- relevant utilities and service bodies
- hazardous materials handling
- effects of weather and conditions on bulkwater assets
- risk management techniques
- WHS
- organisational and statutory requirements

Assessment Conditions

Competency should be assessed in an actual workplace or in a simulated environment, with access to equipment and infrastructure appropriate to the outcome. Competency should be demonstrated over time to ensure the candidate is assessed across a variety of situations.

Assessors must satisfy the NVR/AQTF mandatory competency requirements for assessors.

Links

Companion Volume implementation guides are found in VETNet - https://vetnet.gov.au/Pages/TrainingDocs.aspx?q=26336bc0-04e5-49d9-8c31-46c49b6a0037

Companion Volume implementation guides are found in VETNet - https://vetnet.gov.au/Pages/TrainingDocs.aspx?q=26336bc0-04e5-49d9-8c31-46c49b6a0037

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NWPSOU023 Monitor and implement dam maintenance

Modification History

Release	Comments
1	This unit was released in NWP Water Training Package release 1.0 and meets the Standards for Training Packages. This unit supersedes and is equivalent to NWP320B Monitor and implement dam maintenance. • Unit code updated • Content and formatting updated to comply with the new standards • All PC transitioned from passive to active voice • PC 1.1, 1.2 and 2.1 removed • Two new PC added to Elements 1 and 2

Application

This unit describes the skills required to implement dam maintenance programs, including maintenance of dam safety mechanisms. The ability to interpret technical documentation, investigate and resolve maintenance problems and to collect and analyse technical information is essential to performance.

This unit applies to those working as field and operational staff with a specific responsibility for the maintenance of ungated dams.

The skills and knowledge described in this unit must be applied within the legislative, regulatory and policy environment in which they are carried out. Organisational policies and procedures must be consulted and adhered to manufacturer's specifications.

Those undertaking this unit would work under supervision while performing routine tasks in a limited range of familiar contexts.

No licensing, legislative or certification requirements apply to unit at the time of publication.

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Competency Field

Source

Elements and Performance Criteria

ELEMENTS	PERFORMANCE CRITERIA
Elements describe the essential outcomes	Performance criteria describe the performance needed to demonstrate achievement of the element. Where bold italicised text is used, further information is detailed in the range of conditions section.
1. Plan and prepare for dam maintenance	1.1 Plan and prepare for dam maintenance according to management plans and relevant documentation. 1.2 Undertake inspection procedures. 1.3 Develop a maintenance plan.
2. Implement dam maintenance plans	2.1 Schedule dam maintenance works. 2.2 Maintain and repair civil and mechanical dam assets. 2.3 Operate and test equipment including winches, valves and gates.
3. Compile maintenance and inspection reports	3.1 Collect required data from inspections, measurement instruments and delegated personnel. 3.2 Collate, process, evaluate, validate, record and store data. 3.3 Record and report structural, material and/or equipment problems. 3.4 Recommend remedial action.

Foundation Skills

The foundation skills demands of this unit have been mapped for alignment with the Australian Core Skills Framework (ACSF). The following tables outline the performance levels indicated for successful attainment of the unit.

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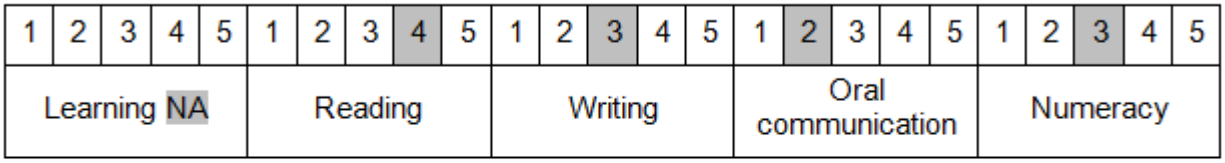
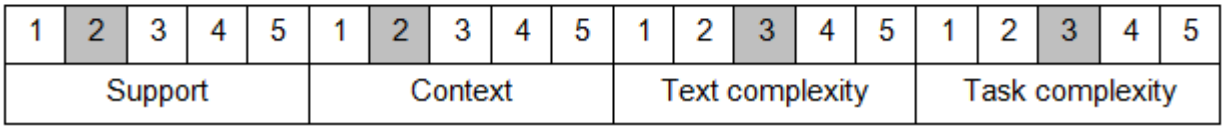
ACSF levels indicative of performance:



Performance variables:



Further information on ACSF and the foundation skills underpinning this unit can be found in the Foundation Skills Guide on the GSA website.

Range of Conditions

Dam types include:	• concrete • embankment

Unit Mapping Information

This unit supersedes and is equivalent to NWP320B Monitor and implement dam maintenance.

Links

Companion Volume implementation guides are found in VETNet - https://vetnet.gov.au/Pages/TrainingDocs.aspx?q=26336bc0-04e5-49d9-8c31-46c49b6a0037

Companion Volume implementation guides are found in VETNet - https://vetnet.gov.au/Pages/TrainingDocs.aspx?q=26336bc0-04e5-49d9-8c31-46c49b6a0037

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Assessment Requirements for NWPSOU023 Monitor and implement dam maintenance

Modification History

Release	Comments
1	These Assessment Requirements were released in NWP Water Training Package release 1.0 and meet the Standards for Training Packages. • Assessment Requirements created drawing upon specified assessment information from superseded unit

Performance Evidence

Evidence required to demonstrate competence must satisfy all of the requirements of the elements and performance criteria. The candidate must be assessed in at least one type of dam listed in the Range of Conditions. If not otherwise specified the candidate must demonstrate evidence of performance of the following on at least one occasion.

- identifying and correcting maintenance problems
- identifying security and access maintenance issues
- conducting inspections
- coordinating maintenance activities
- interpreting plans, drawings, instructions, standard operating procedures, policies and standards
- using safety, rescue and personal protective equipment
- using relevant tools and machinery
- identifying safety hazards
- carrying out maintenance of specified assets
- proposing and justifying maintenance activities
- analysing and processing data
- inspecting and operating relevant equipment and instruments
- monitoring and implementing dam maintenance
- interpreting technical documentation
- collecting and evaluating technical information
- preparing required reports

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Knowledge Evidence

Evidence required to demonstrate competence must satisfy all of the requirements of the elements and performance criteria. If not otherwise specified the depth of knowledge demonstrated must be appropriate to the job context of the candidate.

- dam design principles
- risks to dams
- historic dam information
- potential earthquake effects
- properties of stored water
- dam maintenance principles and practices
- basic materials science
- basic principles of hydraulics
- system layout
- environmental aspects of maintenance
- lock out procedures for mechanical and electrical installations
- control systems
- equipment operation
- relevant utilities and service bodies
- hazardous materials handling
- effects of weather and conditions on bulkwater assets
- basic principles of soil mechanics
- basic concrete structure, strengths and deterioration
- basic dam construction procedures
- dam failure mechanisms
- risk management techniques
- WHS
- risk factors and potential hazards of maintenance of dam assets
- maintenance standard operating procedures
- organisational and statutory requirements

Assessment Conditions

Competency should be assessed in an actual workplace or in a simulated environment, with access to equipment and infrastructure appropriate to the outcome. Competency should be demonstrated over time to ensure the candidate is assessed across a variety of situations.

Assessors must satisfy the NVR/AQTF mandatory competency requirements for assessors.

Links

Companion Volume implementation guides are found in VETNet - https://vetnet.gov.au/Pages/TrainingDocs.aspx?q=26336bc0-04e5-49d9-8c31-46c49b6a0037

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Companion Volume implementation guides are found in VETNet - https://vetnet.gov.au/Pages/TrainingDocs.aspx?q=26336bc0-04e5-49d9-8c31-46c49b6a0037

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NWPSOU027 Route floods through storages

Modification History

Release	Comments
1	This unit was released in NWP Water Training Package release 1.0 and meets the Standards for Training Packages. This unit supersedes and is equivalent to NWP318A Monitor and operate gated spillways. • Unit code updated • Content and formatting updated to comply with the new standards • All PC transitioned from passive to active voice • Unit title changed to better reflect unit outcomes • PC 2.1 and 2.2 removed • Two new PC added to Element 2 • one new PC added to Element 4

Application

This unit of competency describes the skills required to manage and conduct surveillance of catchment run-off through dams and other water storage assets with gated spillways for dam/storage operations and flood routing.

This unit applies to those working as field and operational staff with a specific responsibility for the operation of dams and other water storage assets with gated spillways.

The skills and knowledge described in this unit must be applied within the legislative, regulatory and policy environment in which they are carried out. Organisational policies and procedures must be consulted and adhered to, particularly those related to WHS and manufacturer guidelines.

Those undertaking this unit would work under indirect supervision, while performing routine tasks in a familiar context, ensuring minimum damage to the environment.

No licensing, legislative or certification requirements apply to unit at the time of publication.

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Competency Field

Source

Elements and Performance Criteria

ELEMENTS	PERFORMANCE CRITERIA
Elements describe the essential outcomes	Performance criteria describe the performance needed to demonstrate achievement of the element. Where bold italicised text is used, further information is detailed in the range of conditions section.
1. Monitor flow and flood routing	1.1 Monitor catchment behaviour during normal and flood conditions. 1.2 Determine outflow using standard flow rate calculations. 1.3 Determine flow control settings.
2. Plan and prepare for dam or storage operation	2.1 Plan and prepare for dam or storage operations. 2.2 Conduct inspections. 2.3 Develop hydrograph template.
3. Implement dam/water storage operation plans	3.1 Apply operation plans. 3.2 Inspect and test plant and equipment. 3.3 Test, assess and document safety mechanisms.
4. Regulate flows	4.1 Plot flood data on hydrograph. 4.2 Regulate flow control mechanisms to maintain safety of asset and required system supply and flood routing. 4.3 Produce data relating to flood performance.

Foundation Skills

The foundation skills demands of this unit have been mapped for alignment with the Australian Core Skills Framework (ACSF). The following tables outline the performance levels indicated for successful attainment of the unit.

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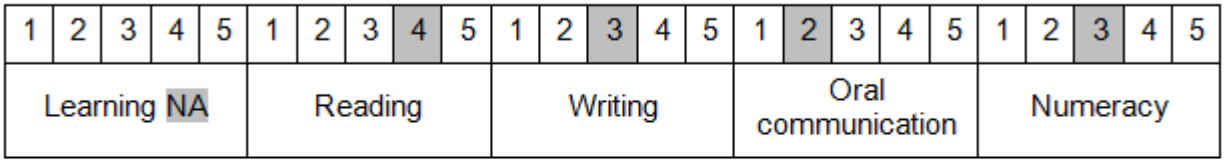
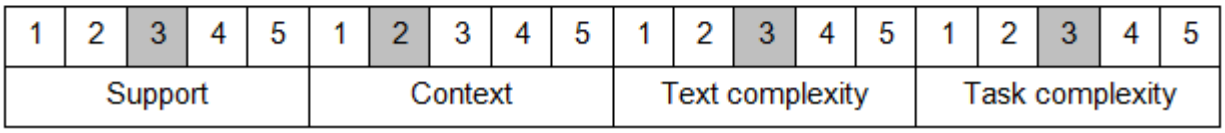
ACSF levels indicative of performance:



Performance variables:



Further information on ACSF and the foundation skills underpinning this unit can be found in the Foundation Skills Guide on the GSA website.

Unit Mapping Information

This unit supersedes and is equivalent to NWP318A Monitor and operate gated spillways.

Links

Companion Volume implementation guides are found in VETNet - https://vetnet.gov.au/Pages/TrainingDocs.aspx?q=26336bc0-04e5-49d9-8c31-46c49b6a0037

Companion Volume implementation guides are found in VETNet - https://vetnet.gov.au/Pages/TrainingDocs.aspx?q=26336bc0-04e5-49d9-8c31-46c49b6a0037

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Assessment Requirements for NWPSOU027 Route floods through storages

Modification History

Release	Comments
1	These Assessment Requirements were released in NWP Water Training Package release 1.0 and meet the Standards for Training Packages. • Assessment Requirements created drawing upon specified assessment information from superseded unit

Performance Evidence

Evidence required to demonstrate competence must satisfy all of the requirements of the elements and performance criteria. If not otherwise specified the candidate must demonstrate evidence of performance of the following on at least one occasion.

- calculating inflow and outflow rates
- interpreting and plotting graphs
- operating controls and ancillary equipment
- conducting inspections
- interpreting plans, drawings, instructions, standard operating procedures, policies and standards
- using safety equipment and personal protective equipment
- identifying hazards
- using equipment and instruments
- managing and conducting surveillance of catchment run-off through dams and other water storage assets
- operating gated spillways
- identifying and investigating operational problems
- collecting and analysing technical information
- preparing required reports

Knowledge Evidence

Evidence required to demonstrate competence must satisfy all of the requirements of the elements and performance criteria. If not otherwise specified the depth of knowledge demonstrated must be appropriate to the job context of the candidate.

- properties of stored water

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- system hydraulics
- effects of water and catchment conditions on flow expectations
- interrogation of catchment monitoring equipment
- water flow measurement
- operation of flood gates or plant
- control systems
- dam operation principles
- materials science
- communication systems
- principles of hydraulics
- system layout
- environmental aspects of operation and maintenance
- lock out procedures for mechanical and electrical installations
- control systems
- equipment operation
- relevant utilities and service bodies
- hazardous materials handling
- effects of weather and conditions on bulkwater assets
- principles of dam inspection
- risk management techniques
- WHS
- organisational and statutory requirements

Assessment Conditions

Competency should be assessed in an actual workplace or in a simulated environment, with access to equipment and infrastructure appropriate to the outcome. Competency should be demonstrated over time to ensure the candidate is assessed across a variety of situations.

Assessors must satisfy the NVR/AQTF mandatory competency requirements for assessors.

Links

Companion Volume implementation guides are found in VETNet - https://vetnet.gov.au/Pages/TrainingDocs.aspx?q=26336bc0-04e5-49d9-8c31-46c49b6a0037

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NWPSOU051 Monitor and operate groundwater extraction

Modification History

Release	Comments
1	This unit was released in NWP Water Training Package release 1.0 and meets the Standards for Training Packages. • New unit, created drawing upon information from deleted units NWP242B and NWP243B

Application

This unit describes the skills required to monitor the extraction of water from waterways and water bodies and to report risks, compliance and complaints. This includes operating pumps and meters. Skills to moniter the availability and quality of supply and control of water flows from the source are also required, in conjunction with the ability to apply legislative and organisational requirements.

This unit applies to those working as field staff with responsibility for ensuring that water extraction complies with water use legislation.

The skills and knowledge described in this unit must be applied within the legislative, regulatory and policy environment in which they are carried out. Organisational policies and procedures must be consulted and adhered to.

Those undertaking this unit would work under supervision, while performing routine tasks in range of familiar contexts.

No licensing, legislative or certification requirements apply to unit at the time of publication.

Competency Field

Source

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Elements and Performance Criteria

ELEMENTS	PERFORMANCE CRITERIA
Elements describe the essential outcomes	Performance criteria describe the performance needed to demonstrate achievement of the element. Where bold italicised text is used, further information is detailed in the range of conditions section.
1. Prepare for work	1.1 Interpret relevant legislation and organisational rules and requirements. 1.2 Locate bore sites from plans and job specifications. 1.3 Schedule and plan inspection. 1.4 Select, check and prepare basic equipment to monitor water extraction.
2. Monitor and operate groundwater extraction systems	2.1 Monitor designated locations within groundwater source area according to agreed schedule. 2.2 Conduct inspection taking readings of meters for water depth and water quality. 2.3 Check the integrity of assets. 2.4 Collect samples. 2.5 Make adjustments to flows when required. 2.6 Identify breaches of legislative and organisational requirements.
3. Identify and report risks, breaches and complaints	3.1 Identify risks to public, users and environment. 3.2 Identify and report breaches of relevant legislation. 3.3 Investigate and report complaints from the public and users regarding water allocation and quality.

Foundation Skills

The foundation skills demands of this unit have been mapped for alignment with the Australian Core Skills Framework (ACSF). The following tables outline the performance levels indicated for successful attainment of the unit.

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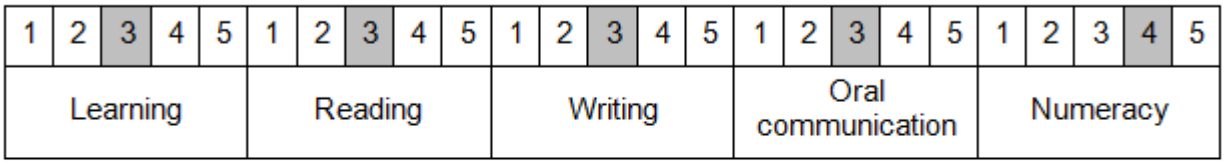
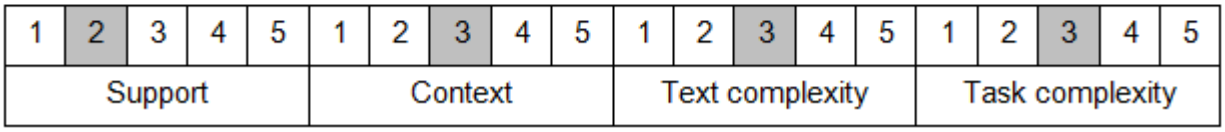
ACSF levels indicative of performance:



Performance variables:



Further information on ACSF and the foundation skills underpinning this unit can be found in the Foundation Skills Guide on the GSA website.

Unit Mapping Information

No equivalent unit.

Links

Companion Volume implementation guides are found in VETNet - https://vetnet.gov.au/Pages/TrainingDocs.aspx?q=26336bc0-04e5-49d9-8c31-46c49b6a0037

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Assessment Requirements for NWPSOU051 Monitor and operate groundwater extraction

Modification History

Release	Comments
1	These Assessment Requirements were released in NWP Water Training Package release 1.0 and meet the Standards for Training Packages.

Performance Evidence

Evidence required to demonstrate competence must satisfy all of the requirements of the elements and performance criteria. If not otherwise specified the candidate must demonstrate evidence of performance of the following on at least one occasion.

- interpreting plans, instructions and standard operating procedures
- identifying and preventing well contamination
- adjusting pump flows
- isolating tag and lock out pumps
- reading meters
- taking samples
- conducting risk assessment
- inspecting bore assets
- reading levels
- calculating recharge and extraction rates

Knowledge Evidence

Evidence required to demonstrate competence must satisfy all of the requirements of the elements and performance criteria. If not otherwise specified the depth of knowledge demonstrated must be appropriate to the job context of the candidate.

- system hydraulics and flushing
- system layout
- lock-out procedures for pumps and electric motors
- risk factors and potential hazards of groundwater source systems
- well contaminants
- equipment operation, capacity and limitations
- effects of weather and conditions on operation of site or plant
- basic types of bore construction and principles
- characteristics of groundwater and aquifer

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- characteristics of groundwater systems

Assessment Conditions

Competency should be assessed in an actual workplace or in a simulated environment, with access to equipment and infrastructure appropriate to the outcome. Competency should be demonstrated over time to ensure the candidate is assessed across a variety of situations.

Assessors must satisfy the NVR/AQTF mandatory competency requirements for assessors.

Links

Companion Volume implementation guides are found in VETNet - https://vetnet.gov.au/Pages/TrainingDocs.aspx?q=26336bc0-04e5-49d9-8c31-46c49b6a0037

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NWPSOU054 Monitor and operate pump stations

Modification History

Release	Comments
1	This unit was released in NWP Water Training Package release 1.0 and meets the Standards for Training Packages. This unit supersedes and is equivalent to NWP259B Operate, monitor and maintain pump stations. • Unit code updated • Content and formatting updated to comply with the new standards • All PC transitioned from passive to active voice • Unit title changed to better reflect unit outcomes • PC 1.2 and 3.1 removed • PC 1.4 revised • PC 3.3 and 3.4 merged

Application

This unit describes the skills required to operate and monitor the performance of pump stations in water and wastewater systems and undertake minor maintenance, or organise more complex maintenance, of pump stations. This may include minor maintenance tasks, including gland adjustment, packing replacement and the replacement of some fittings.

This unit applies to those working as staff with specific responsibility for ensuring that pump stations operate according to organisational requirements.

The skills and knowledge described in this unit must be applied within the legislative, regulatory and policy environment in which they are carried out. Organisational policies and procedures must be consulted and adhered to, particularly those related to WHS, maintenance standards and manufacturer specifications.

Those undertaking this unit would work under indirect supervision, while performing routine tasks in a familiar context, ensuring minimal damage to the environment.

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No licensing, legislative or certification requirements apply to unit at the time of publication.

Competency Field

Source

Elements and Performance Criteria

ELEMENTS	PERFORMANCE CRITERIA
Elements describe the essential outcomes	Performance criteria describe the performance needed to demonstrate achievement of the element. Where bold italicised text is used, further information is detailed in the range of conditions section.
1. Plan and prepare work	1.1 Determine pump station work requirements from standard operating and maintenance procedures. 1.2 Perform site check to prevent damage to other utilities and the environment. 1.3 Select and check equipment to meet safety requirements of task and site. 1.4 Select, fit and use personal protective equipment. 1.5 Handle, use and store chemicals.
2. Operate pump stations	2.1 Identify and set or adjust pump station components. 2.2 Carry out routine security inspections and cleaning duties. 2.3 Operate pump station.
3. Maintain pump stations	3.1 Inspect pump station components and identify maintenance needs. 3.2 Schedule maintenance tasks, order appropriate materials and conduct maintenance tasks. 3.3 Identify and report pump station faults and carry out minor repairs.
4. Monitor and adjust pump station performance	4.1 Apply pump station performance targets. 4.2 Identify and apply monitoring points and timing. 4.3 Monitor pump station and adjust, where necessary, to maintain operational parameters.
5. Check outsourced maintenance work	5.1 Check that completed maintenance and repairs meet specifications. 5.2 Check return of pumping station to service.
6. Finalise work	6.1 Check, maintain and store equipment, tools and materials. 6.2 Restore work site. 6.3 Maintain workplace records as required.

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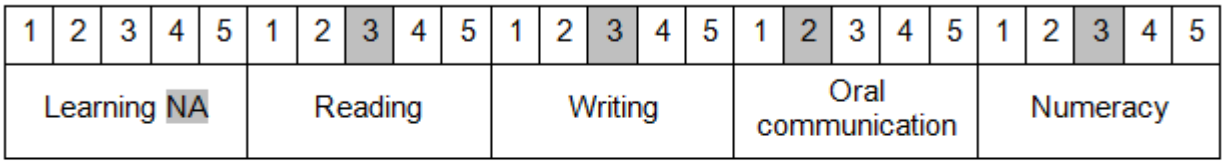
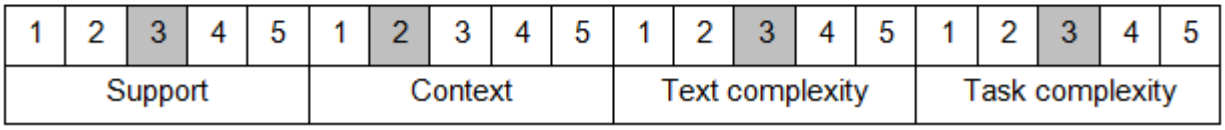
Foundation Skills

The foundation skills demands of this unit have been mapped for alignment with the Australian Core Skills Framework (ACSF). The following tables outline the performance levels indicated for successful attainment of the unit.

ACSF levels indicative of performance:



Performance variables:



Further information on ACSF and the foundation skills underpinning this unit can be found in the Foundation Skills Guide on the GSA website.

Unit Mapping Information

This unit supersedes and is equivalent to NWP259B Operate, monitor and maintain pump stations.

Links

Companion Volume implementation guides are found in VETNet - https://vetnet.gov.au/Pages/TrainingDocs.aspx?q=26336bc0-04e5-49d9-8c31-46c49b6a0037

Companion Volume implementation guides are found in VETNet - https://vetnet.gov.au/Pages/TrainingDocs.aspx?q=26336bc0-04e5-49d9-8c31-46c49b6a0037

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Assessment Requirements for NWPSOU054 Monitor and operate pump stations

Modification History

Release	Comments
1	These Assessment Requirements were released in NWP Water Training Package release 1.0 and meet the Standards for Training Packages. • Assessment Requirements created drawing upon specified assessment information from superseded unit

Performance Evidence

Evidence required to demonstrate competence must satisfy all of the requirements of the elements and performance criteria. If not otherwise specified the candidate must demonstrate evidence of performance of the following on at least one occasion.

- operating and maintaining pumps and pumping stations
- identifying system faults, operational problems and hazards
- implementing remedial action
- operating service
- responding to operational problems
- collecting data
- producing reports and logs
- using safety and personal protective equipment
- using tools and machinery
- following plans and instructions
- performing work-related calculations
- using communication systems
- planning and preparing for work, including selecting equipment and chemicals
- conducting a security inspection
- monitoring and adjusting pump station performance
- checking quality of outsourced maintenance work
- finalising work, including completing documentation

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Knowledge Evidence

Evidence required to demonstrate competence must satisfy all of the requirements of the elements and performance criteria. If not otherwise specified the depth of knowledge demonstrated must be appropriate to the job context of the candidate.

- system hydraulics basics, including suction and lift
- system layout
- principles and purpose of pump operation
- WHS requirements
- types of pump and their operational function
- pump and pump station operation and maintenance procedures and standards
- principles affecting selection of pump station monitoring points and timing of monitoring activities
- environmental aspects of operation
- lock-out procedures for mechanical and electrical installations
- relevant utilities and service bodies
- communication systems
- hazardous materials handling
- risk factors and potential hazards of operating wastewater transfer systems
- equipment operation, capacity and limitations
- effects of weather and conditions on system
- control systems
- pump station components
- high and low voltage requirements
- effect of lightning strikes

Assessment Conditions

Competency should be assessed in an actual workplace or in a simulated environment, with access to equipment and infrastructure appropriate to the outcome. Competency should be demonstrated over time to ensure the candidate is assessed across a variety of situations.

Assessors must satisfy the NVR/AQTF mandatory competency requirements for assessors.

Links

Companion Volume implementation guides are found in VETNet - https://vetnet.gov.au/Pages/TrainingDocs.aspx?q=26336bc0-04e5-49d9-8c31-46c49b6a0037

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NWPTRT001 Operate and control water treatment processes

Modification History

Release	Comments
1	This unit was released in NWP Water Training Package release 1.0 and meets the Standards for Training Packages. • New unit, created drawing upon information from deleted units NWP260A, NWP261A and NWP345B

Application

This unit of competency describes the skills required to operate and control a water treatment plant, to report on water treatment plant system performance and process quality control. The ability to operate water treatment processes in urban and/or rural areas, in compliance with relevant water legislation and regulations and Australian Drinking Water Guidelines, is vital to performance.

This unit applies to those working as operational staff in water treatment plants with responsibility for the practical and safe operation of plant, equipment and processes.

The skills and knowledge described in this unit must be applied within the legislative, statutory, regulatory and policy environment in which they are carried out. Organisational policies and procedures must be consulted and adhered to.

Those undertaking this unit would work under supervision, while performing routine tasks, within a familiar context.

No licensing, legislative or certification requirements apply to unit at the time of publication.

Competency Field

Treatment

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Elements and Performance Criteria

ELEMENTS	PERFORMANCE CRITERIA
Elements describe the essential outcomes	Performance criteria describe the performance needed to demonstrate achievement of the element. Where bold italicised text is used, further information is detailed in the range of conditions section.
1. Plan and prepare for work	1.1 Determine work requirements from job specifications and plans. 1.2 Select and check equipment to meet safety requirements of task and site. 1.3 Select, fit and use safety equipment including personal protective equipment.
2. Operate and control process	2.1 Carry out routine plant inspections according to the type of plant. 2.2 Identify and report process faults and the operational condition of the plant. 2.3 Collect samples and conduct standard tests. 2.4 Carry out basic adjustments to improve process performance.
3. Complete documentation	3.1 Collect, interpret, record and complete process data. 3.2 Identify data that falls outside normal parameters and report for further action.

Foundation Skills

The foundation skills demands of this unit have been mapped for alignment with the Australian Core Skills Framework (ACSF). The following tables outline the performance levels indicated for successful attainment of the unit.

ACSF levels indicative of performance:

1	2	3	4	5	1	2	3	4	5	1	2	3	4	5	1	2	3	4	5	1	2	3	4	5
Learning					Reading					Writing					Oral communication					Numeracy					

Performance variables:

1	2	3	4	5	1	2	3	4	5	1	2	3	4	5	1	2	3	4	5
Support					Context					Text complexity					Task complexity				

Further information on ACSF and the foundation skills underpinning this unit can be found in the Foundation Skills Guide on the GSA website.

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Range of Conditions

Current processes include:	• pre-treatment
	  • chemical dosing
	  • coagulation
	  • pH adjustment
	  • iron manganese
	  • pre-screening
	• separation
	  • clarification
	  • filtration
	  • DAF
	• disinfection
	• post-treatment
	  • fluoride
	  • ozone
	  • BAC
	  • stabilisation

Unit Mapping Information

No equivalent unit.

Links

Companion Volume implementation guides are found in VETNet - https://vetnet.gov.au/Pages/TrainingDocs.aspx?q=26336bc0-04e5-49d9-8c31-46c49b6a0037

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Assessment Requirements for NWPTRT001 Operate and control water treatment processes

Modification History

Release	Comments
1	These Assessment Requirements were released in NWP Water Training Package release 1.0 and meet the Standards for Training Packages.

Performance Evidence

Evidence required to demonstrate competence must satisfy all of the requirements of the elements and performance criteria. The candidate must be assessed operating at least two of the processes listed in the Range of Conditions, of which one must be from separation and one from disinfection. If not otherwise specified the candidate must demonstrate evidence of performance of the following on at least one occasion.

- conducting routine plant inspections
- interpreting safety data sheets (SDS)
- applying basic mathematical formulae
- completing logs
- preparing and applying chemical dosing including at least one of:
  - pH adjustment
  - coagulants
  - polymers
  - flocculants
  - disinfectants
  - fluoride
- interpreting plans, charts and instructions

Knowledge Evidence

Evidence required to demonstrate competence must satisfy all of the requirements of the elements and performance criteria. If not otherwise specified the depth of knowledge demonstrated must be appropriate to the job context of the candidate.

- water cycle
- sources of water
- demands and uses of water, both domestic and industrial
- physical, chemical and microbiological characteristics of water within the water treatment process

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- reasons for water treatment
- types of treatment plants and processes
- major chemicals and equipment used
- water treatment plant hazards
- risk factors and potential hazards associated with the operation of water treatment processes
- physical, chemical and microbiological characteristics of water within the water treatment process
- chemical and biological principles that form the basis of water treatment
- types of components
- relevant technologies
- water quality principles
- relevant guidelines and standards
- risk management principles of water treatment (HACCP)
- basic knowledge of types of chemicals and water chemistry

Candidate should demonstrate basic knowledge of all processes listed in Range of Conditions.

Assessment Conditions

Competency should be assessed in an actual workplace or in a simulated environment, with access to equipment and infrastructure appropriate to the outcome. Competency should be demonstrated over time to ensure the candidate is assessed across a variety of situations.

Assessors must satisfy the NVR/AQTF mandatory competency requirements for assessors.

Links

Companion Volume implementation guides are found in VETNet - https://vetnet.gov.au/Pages/TrainingDocs.aspx?q=26336bc0-04e5-49d9-8c31-46c49b6a0037

Companion Volume implementation guides are found in VETNet - https://vetnet.gov.au/Pages/TrainingDocs.aspx?q=26336bc0-04e5-49d9-8c31-46c49b6a0037

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NWPTRT012 Operate and control fluoride addition process

Modification History

Release	Comments
1	This unit was released in NWP Water Training Package release 1.0 and meets the Standards for Training Packages. This unit supersedes and is equivalent to NWP276A Monitor, operate and report fluoridation systems. • Unit code updated • Content and formatting updated to comply with the new standards • All PC transitioned from passive to active voice • Unit title changed to better reflect unit outcomes. • Element 4 reworded • One new PC added to Element 3

Application

This unit describes the skills required to monitor and operate fluoridation processes and to report on water quality control.

This unit applies to those working as water operators responsible for fluoridation processes in water treatment. It may be a requirement for compliance with state and territory legislation and government water quality guidelines.

The skills and knowledge described in this unit must be applied within the legislative, regulatory and policy environment in which they are carried out. Organisational policies and procedures must be consulted and adhered to, particularly those relating to WHS.

Those undertaking this unit would work under supervision, while performing routine tasks, in a range of familiar contexts.

No licensing, legislative or certification requirements apply to unit at the time of publication.

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Competency Field

Treatment

Elements and Performance Criteria

ELEMENTS	PERFORMANCE CRITERIA
Elements describe the essential outcomes	Performance criteria describe the performance needed to demonstrate achievement of the element. Where bold italicised text is used, further information is detailed in the range of conditions section.
1. Plan and prepare for work	1.1 Determine work requirements. 1.2 Select and check equipment and tools required to meet safety requirements of task and site. 1.3 Select, fit and use personal protective equipment.
2. Monitor process performance	2.1 Monitor fluoridation processes. 2.2 Collect process samples and conduct standard tests. 2.3 Maintain and monitor relevant WHS requirements. 2.4 Collect and record process data and perform calculations.
3. Prepare and apply fluoride dosing	3.1 Handle, use and store fluoridation chemicals. 3.2 Apply fluoride dosing and perform calculations. 3.3 Monitor fluoride levels.
4. Complete documentation	4.1 Maintain information relating to fluoride supply and usage. 4.2 Produce information relating to maintenance and operation. 4.3 Record information and submit for continuous improvement and incident management.

Foundation Skills

The foundation skills demands of this unit have been mapped for alignment with the Australian Core Skills Framework (ACSF). The following tables outline the performance levels indicated for successful attainment of the unit.

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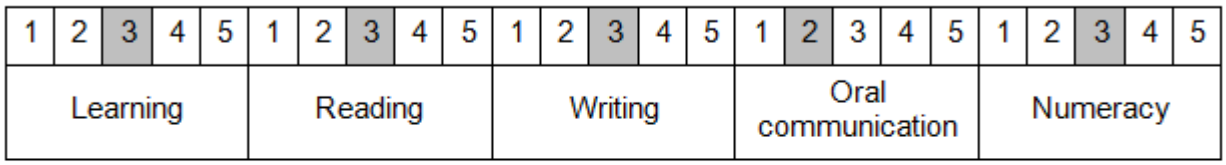
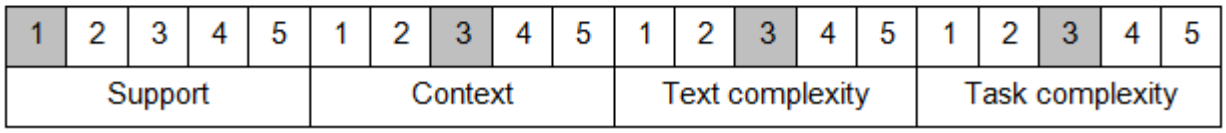
ACSF levels indicative of performance:



Performance variables:



Further information on ACSF and the foundation skills underpinning this unit can be found in the Foundation Skills Guide on the GSA website.

Range of Conditions

Types of fluoridation processes:	• sodium fluoride • fluorosilicic acid • sodium fluorosilicate

Unit Mapping Information

This unit supersedes and is equivalent to NWP276A Monitor, operate and report fluoridation systems.

Links

Companion Volume implementation guides are found in VETNet - https://vetnet.gov.au/Pages/TrainingDocs.aspx?q=26336bc0-04e5-49d9-8c31-46c49b6a0037

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Assessment Requirements for NWPTRT012 Operate and control fluoride addition process

Modification History

Release	Comments
1	These Assessment Requirements were released in NWP Water Training Package release 1.0 and meet the Standards for Training Packages. • Assessment Requirements created drawing upon specified assessment information from superseded unit

Performance Evidence

Evidence required to demonstrate competence must satisfy all of the requirements of the elements and performance criteria. To be deemed competent the candidate must be assessed in at least one of the fluoridation processes listed in the Range of Conditions. If not otherwise specified the candidate must demonstrate evidence of performance of the following on at least one occasion.

- applying policies, regulatory standards and standard operating procedures relevant to fluoridation
- receiving, clarifying and confirming work instructions
- performing chemical dosing calculations
- identifying and reporting control system faults and operational problems
- identifying and reporting hazards
- using literacy skills to produce reports and logs and interpreting a range of workplace documents
- interpreting and following safety data sheets (SDS)
- preparing for work
- selecting and using appropriate tools and equipment, including personal protective equipment
- calculating average fluoride concentrations
- collecting process samples and determining fluoride residuals
- collecting and reporting process data
- preparing and applying fluoride dosing safely
- completing log sheets

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Knowledge Evidence

Evidence required to demonstrate competence must satisfy all of the requirements of the elements and performance criteria. If not otherwise specified the depth of knowledge demonstrated must be appropriate to the job context of the candidate.

- properties of fluoridation chemicals
- fluoridation and its relationship to public health
- fluoride sampling and record keeping
- fluoride addition points
- fluoride system layout and security
- policies and standard operating procedures for fluoride processes
- safe handling using SDS and disposal of fluoride compounds
- risk factors and potential hazards associated with fluoridation
- work-related fluoride calculations
- fluoride dosing processes
- automatic feed rate control systems

Assessment Conditions

Competency should be assessed in an actual workplace or in a simulated environment, with access to equipment and infrastructure appropriate to the outcome. Competency should be demonstrated over time to ensure the candidate is assessed across a variety of situations.

Some components of this unit require assessment in a workplace environment therefore the unit is not suitable for fully external or electronic based assessment.

Consideration must be given to holistic assessment for this unit. Refer to advice in the companion volumes.

Assessors must satisfy the NVR/AQTF mandatory competency requirements for assessors.

Links

Companion Volume implementation guides are found in VETNet - https://vetnet.gov.au/Pages/TrainingDocs.aspx?q=26336bc0-04e5-49d9-8c31-46c49b6a0037

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NWPTRT052 Operate and control hypochlorite disinfection processes

Modification History

Release	Comments
1	This unit was released in NWP Water Training Package release 1.0 and meets the Standards for Training Packages. This unit supersedes and is equivalent to NWP268B Monitor, operate and report chlorine disinfection systems. • Unit code updated • Content and formatting updated to comply with the new standards • All PC transitioned from passive to active voice • Unit title changed to better reflect unit outcomes • Elements 2 and 3 reworded • One new PC added to Elements 1 and 3 • PC 2.3 removed • PC 3.1 revised and renumbered • PC 2.4 and 3.3 renumbered • PC 3.2 and 4.1 revised

Application

This unit describes the skills required to monitor and operate hypochlorite disinfection systems and report on process quality control. This includes the skills required to working safely with sodium hypochlorite solutions and calcium hypochlorite solids, including their safe handling, transport and storage and implementation of emergency response procedures.

This unit applies to those working as operational staff with specific responsibility for hypochlorite disinfection systems in water and wastewater treatment plants.

The skills and knowledge described in this unit must be applied within the legislative, regulatory and policy environment in which they are carried out. Organisational policies and procedures must be consulted and adhered to, particularly those related to WHS and handling of dangerous goods.

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Those undertaking this unit would work under supervision, while performing routine tasks, in a range of familiar contexts.

No licensing, legislative or certification requirements apply to unit at the time of publication.

Competency Field

Treatment

Elements and Performance Criteria

ELEMENTS	PERFORMANCE CRITERIA
Elements describe the essential outcomes	Performance criteria describe the performance needed to demonstrate achievement of the element. Where bold italicised text is used, further information is detailed in the range of conditions section.
1. Plan and prepare for work	1.1 Determine work requirements from job specification and plans. 1.2 Select and check equipment and hypochlorite supplies to meet safety requirements of task and site. 1.3 Select, fit and use personal protective equipment. 1.4 Handle and store hypochlorite chemicals to maximise shelf life and reduce loss of available chlorine. 1.5 Conduct the percentage available chlorine test.
2. Monitor process performance	2.1 Monitor hypochlorite disinfection ***processes*** according to agreed schedule and procedures. 2.2 Collect samples and conduct process tests. 2.3 Make process adjustments as required to maintain effectiveness of hypochlorite disinfection.
3. Apply chemical dosing	3.1 Prepare and apply hypochlorite chemicals. 3.2 Control hypochlorite ***dosing*** to maintain required residual.
4. Complete documentation	4.1 Maintain information relating to hypochlorite supply and usage. 4.2 Collect and record process data. 4.3 Report observations outside defined parameters for further action.

Foundation Skills

The foundation skills demands of this unit have been mapped for alignment with the Australian Core Skills Framework (ACSF). The following tables outline the performance levels indicated for successful attainment of the unit.

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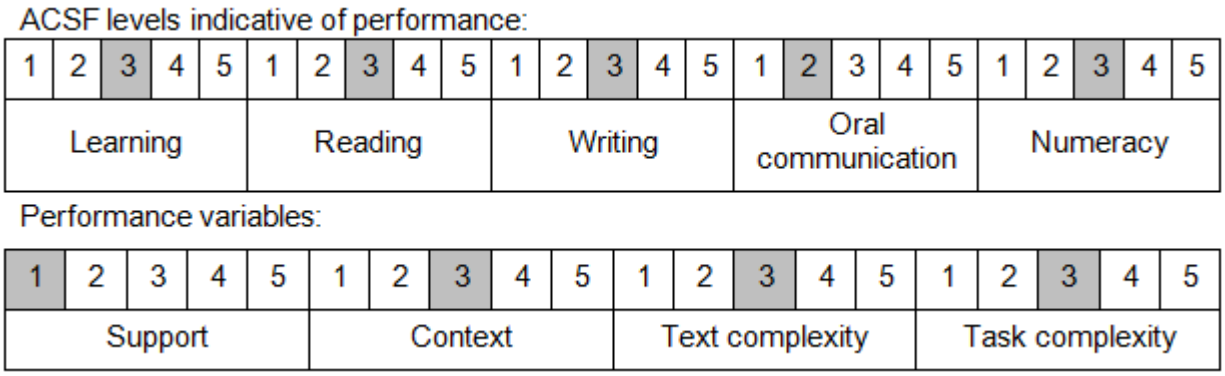

Further information on ACSF and the foundation skills underpinning this unit can be found in the Foundation Skills Guide on the GSA website.

Range of Conditions

Processes include:	• sodium hypochlorite solution • sodium hypochlorite
Technologies include:	• calcium hypochlorite granules • calcium hypochlorite tablets
Dosing procedures include:	• chlorinator shutdown, start up and isolation • purging operations • leak testing • dosing pump checks

Unit Mapping Information

This unit supersedes and is equivalent to NWP268B Monitor, operate and report chlorine disinfection systems.

Links

Companion Volume implementation guides are found in VETNet - https://vetnet.gov.au/Pages/TrainingDocs.aspx?q=26336bc0-04e5-49d9-8c31-46c49b6a0037

Companion Volume implementation guides are found in VETNet - https://vetnet.gov.au/Pages/TrainingDocs.aspx?q=26336bc0-04e5-49d9-8c31-46c49b6a0037

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Assessment Requirements for NWPTRT052 Operate and control hypochlorite disinfection processes

Modification History

Release	Comments
1	These Assessment Requirements were released in NWP Water Training Package release 1.0 and meet the Standards for Training Packages. • Assessment Requirements created drawing upon specified assessment information from superseded unit

Performance Evidence

Evidence required to demonstrate competence must satisfy all of the requirements of the elements and performance criteria. The candidate must be assessed in at least one type of process, in at least one type of technology and in at least one type of dosing procedure listed in the Range of Conditions. If not otherwise specified the candidate must demonstrate evidence of performance of the following on at least one occasion.

- applying policies, standard operating procedures and regulatory standards
- performing work-related calculations
- identifying and responding to process faults and control system faults
- identifying hazards
- performing hypochlorite tests and chlorine residual sampling and testing
- interpreting safety data sheets (SDS)
- monitoring, operating and reporting on hypochlorite disinfection systems
- selecting and using appropriate tools and equipment, including personal protective equipment
- collecting and reporting process data
- preparing and applying hypochlorite dosing safely
- performing process calculations, including at least one of:
  - feed rate
  - dosage
  - Ct

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Knowledge Evidence

Evidence required to demonstrate competence must satisfy all of the requirements of the elements and performance criteria. If not otherwise specified the depth of knowledge demonstrated must be appropriate to the job context of the candidate.

- properties and chemistry of hypochlorite chemicals
- effects of pH, time, temperature, UV exposure and impurities on hypochlorite breakdown
- microbiological guidelines
- reactions with water to produce hypochlorous acid/hypochlorite ion
- impact of pH
- chlorine demands, including:
  - ammonia
  - natural organic matter (NOM)
  - turbidity
  - iron, manganese and nitrite
- disinfection by-products (DBP)
- breakpoint
- contact time
- hypochlorite dosing system layout for sodium hypochlorite and/or calcium hypochlorite dosing systems
- hazardous substances handling
- risk factors and potential hazards associated with hypo chlorination
- work-related hypochlorite calculations
- hypochlorite dosing processes
- automatic feed rate control systems
- SDS

Assessment Conditions

Competency should be assessed in an actual workplace or in a simulated environment, with access to equipment and infrastructure appropriate to the outcome. Competency should be demonstrated over time to ensure the candidate is assessed across a variety of situations.

Some components of this unit require assessment in a workplace environment therefore the unit is not suitable for fully external or electronic based assessment.

Assessors must satisfy the NVR/AQTF mandatory competency requirements for assessors.

Links

Companion Volume implementation guides are found in VETNet - https://vetnet.gov.au/Pages/TrainingDocs.aspx?q=26336bc0-04e5-49d9-8c31-46c49b6a0037

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RIIHAN309E Conduct telescopic materials handler operations

Modification History

Release	Comment
1	This unit replaces RIIHAN309D Conduct telescopic materials handler operations. Performance criteria 7.3 removed. Knowledge evidence amended to remove earthworks from basic calculations. Mapping table added.

Application

This unit describes a participant's skills and knowledge required to conduct telescopic materials handler operations in the Resources and Infrastructure Industries.

This unit is appropriate for those working in operational roles.

Licensing, legislative, regulatory and certification requirements that apply to this unit can vary between states, territories, and industry sectors. Relevant information must be sourced prior to application of the unit.

Elements and Performance Criteria

1. Plan and prepare for telescopic materials handler operations	1.1 Access, interpret and apply telescopic materials handler documentation and ensure the work activity is compliant 1.2 Obtain, read, interpret, clarify and confirm work requirements 1.3 Identify and address potential risks, hazards and environmental issues, and implement control measures 1.4 Select and wear personal protective equipment appropriate for work activities 1.5 Identify, obtain and apply signage requirements 1.6 Select plant, tools and equipment, check for serviceability/faults and rectify or report verbally or in writing
2. Conduct telescopic materials handler pre-operational checks	2.1 Perform pre-start, start-up, park-up and shutdown procedures 2.2 Check telescopic materials handler controls, brakes, attachments and other implements for manoeuvrability and serviceability and ensure faults are rectified or reported
3. Operate telescopic materials handler	3.1 Assess site and operating hazards and apply safe operating techniques

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	3.2 Operate telescopic materials handler
4. Attach, secure, lift, carry and place materials	4.1 Use load handling communication methods with all parties 4.2 Communicate with Dogman to establish the weight of the load 4.3 Communicate with Dogman to ensure safe working load requirements have been assessed and appropriate slings and lifting gear has been selected, attached and secured 4.4 Locate machinery and ensure stability 4.5 Shift the load 4.6 Use conventional hand and audible signals during the operation
5. Select, remove and fit attachments	5.1 Select attachment for the task 5.2 Move and fit attachment 5.3 Test and confirm correct fitting and operation 5.4 Use attachment per manufacturer's recommendations and design limits 5.5 Remove, clean and store attachment
6. Relocate the telescopic materials handler	6.1 Prepare machine and equipment for relocation 6.2 Transport machine and equipment safely between worksites, observing relevant codes and traffic management requirements
7. Carry out machine operator maintenance	7.1 Park and prepare telescopic materials handler for maintenance and shut down 7.2 Conduct inspection and fault finding 7.3 Perform scheduled operator maintenance 7.4 Process written records
8. Conduct housekeeping activities	8.1 Clean-up work area and dispose of or recycle materials 8.2 Clean, check, maintain and store plant, tools and equipment

Foundation Skills

Foundation skills essential to performance are explicit in the performance criteria of this unit. Further information is available in the Resources and Infrastructure Industry Training Package Companion Volume.

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Unit Mapping Information

Code and title current version	**Code and title previous version**	**Comments**	**Equivalence status**
RIIHAN309E Conduct telescopic materials handler operations	RIIHAN309D Conduct telescopic materials handler operations	Performance criteria 7.3 removed. Knowledge evidence amended.	Equivalent

Links

Companion Volume implementation guides are found in VETNet - https://vetnet.gov.au/Pages/TrainingDocs.aspx?q=88a61002-9a21-4386-aaf8-69c76e675272

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Assessment Requirements for RIIHAN309E Conduct telescopic materials handler operations

Modification History

Release	Comment
1	This unit replaces RIIHAN309D Conduct telescopic materials handler operations. Performance criteria 7.3 removed. Knowledge evidence amended to remove earthworks from basic calculations. Mapping table added.

Performance Evidence

Evidence is required to be collected that demonstrates a candidate's competency in this unit. Evidence must be relevant to the roles within this sector's work operations and satisfy all of the requirements of the performance criteria of this unit and include evidence that the candidate:

- locates and applies relevant documentation, policies and procedures
- implements the requirements, procedures and techniques for the safe, effective and efficient completion of conducting telescopic materials handler operations including:
  - applying operational safety
  - accessing, interpreting and applying technical information
  - calculating volume and weights maintaining equipment written records
  - applying fault finding techniques
  - accessing, interpreting and applying environmental management plan
  - carrying out machine operator maintenance
- works effectively with others to undertake and complete the conducting of telescopic materials handler operations that meets all the required outcomes including:
  - complying with written and verbal reporting requirements and procedures
  - communicating clearly and concisely with others to receive and clarify work instructions
  - using load handling communication methods with all parties
  - using conventional hand and audible signals
- demonstrates completion of conducting telescopic materials handler operations that safely, effectively and efficiently meets all of the required outcomes on more than one (1) occasion including:
  - performing pre-start, start-up, park-up and shutdown procedures
  - checking controls, brakes and attachments for manoeuvrability and serviceability and rectifying or reporting faults
  - operating the telescopic materials handler

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- selecting, attaching and securing appropriate slings and lifting gear
- shifting the load
- selecting, removing and fitting attachments
- transporting the machine and equipment between work sites

Knowledge Evidence

The candidate must demonstrate knowledge of the following when conducting telescopic materials handler operations:

- telescopic materials handler types, characteristics, technical capabilities and limitations
- techniques for calculating safe working loads
- telescopic materials handler and attachment operating techniques related to essential tasks
- isolation and traffic control responsibilities and authorities
- safety data sheet and materials handling methods
- methods of changing machine attachments
- safe operating techniques in varying terrain
- basic calculations
- levelling techniques
- job safety analyses/safe work method statement

Assessment Conditions

- Assessors must satisfy the Standards for Registered Training Organisations (RTOs) 2015/AQTF mandatory competency requirements for assessors; and industry regulations for certification and licensing; and,
- this unit is best assessed in the context of this sector's work environment;
- where personal safety or environmental damage are limiting factors, assessment may occur in a simulated environment provided it is realistic and sufficiently rigorous to cover all aspects of this sector's workplace performance, including environment, task skills, task management skills, contingency management skills and job role environment skills; and,
- this unit must be assessed in compliance with relevant legislation/regulation and using policies, procedures, processes and operational manuals directly related to the industry sector for which it is being assessed; and,
- assessment may be conducted in conjunction with the assessment of other units of competency; and,
- assessment must confirm consistent performance can be applied in a range of relevant workplace circumstances; and,
- assessors must demonstrate the performance evidence, and knowledge evidence as outlined in this unit of competency, and through the minimum years of current* work experience specified below in an industry sector relevant to the outcomes of the unit; or,

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- where the assessor does not meet experience requirements a co-assessment or partnership arrangement must exist between the qualified assessor and an industry subject matter expert. The industry subject matter expert should hold the unit being assessed (or an equivalent unit) and/or demonstrate equivalence of skills and knowledge at the unit level. An industry technical expert must also demonstrate skills and knowledge from the minimum years of current work experience specified below in the industry sector, including time spent in roles related to the unit being assessed; and,
- assessor and industry subject matter expert requirements differ depending on the Australian Qualifications Framework Level (AQF) of the qualification being assessed and/or industry sector as follows:

Industry sector	**AQF** Level**	**Required assessor or industry subject matter expert experience**
Drilling, Metalliferous Mining, Coal Mining, Extractive (Quarrying) and Civil Construction	1	1 Year
	2	2 Years
Drilling, Coal Mining and Extractive (Quarrying)	3-6	3 Years
Metalliferous Mining and Civil Construction	3-6	5 Years
Other sectors	Where this unit is being assessed outside of the Resources and Infrastructure Sectors, assessor and/or industry subject matter expert experience should be in-line with industry standards for the sector in which it is being assessed and, where no industry standard is specified, should comply with any relevant regulation.	

*Assessors can demonstrate current work experience through employment within industry in a role relevant to the outcomes of the unit; or, for external assessors this can be demonstrated through exposure to industry by conducting frequent site assessments across various locations.

**Where a unit is being delivered outside of a qualification the first numeric character in the unit code should be considered to indicate the AQF level.

Links

Companion Volume implementation guides are found in VETNet - https://vetnet.gov.au/Pages/TrainingDocs.aspx?q=88a61002-9a21-4386-aaf8-69c76e675272

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RIIMPO304D Conduct wheel loader operations

Modification History

Release	Comment
1	This unit replaces RIIMPO304B Conduct wheel loader operations. Performance Criteria amended to make requirements more explicit; manoeuvring, driving and parking up added; operator maintenance element added.
2	Modification History information inserted.
3	Knowledge Evidence amended; removed repetition in Performance Criteria; amend reference to Licensing requirements in Unit Application.
4	Required frequency and volume of evidence amended in Performance evidence. Substantial amendments made in Assessment Conditions field, including: references to Industry Sectors, assessor and subject matter expert experience requirements, how assessment should be conducted and what it should confirm.
5	Performance Criteria 1.4 and 1.8 were repetitive, removal of 1.8.

Application

This unit describes a participant's skills and knowledge required to conduct wheel loader operations in the Coal and Metalliferous mining and Extractive.

This unit is appropriate for those working in operational roles.

Licensing, legislative, regulatory and certification requirements that apply to this unit can vary between states, territories, and Industry sectors. Relevant information must be sourced prior to application of the unit.

Unit Sector

Coal mining

Extractive

Metalliferous mining

Elements and Performance Criteria

1. Plan and	1.1 Access, interpret and apply wheel loader operations

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prepare for wheel loader operations	documentation and ensure the work activity is compliant 1.2 Obtain, read, interpret, clarify and confirm work requirements 1.3 Identify and address risks, hazards and environmental issues and implement control measures 1.4 Select and wear personal protective equipment appropriate for work activities and interpret emergency procedures, and be prepared for fire/accident/emergency 1.5 Access, interpret and apply geological and survey data required to complete the allocated job 1.6 Inspect and prepare work area in coordination with others 1.7 Select, and check for faults, equipment and/or attachments for work activities
2. Operate the wheel loader	2.1 Carry out start-up, park, shutdown and secure equipment procedures 2.2 Coordinate activities with others at the site prior to commencing, during, and on completions of the work activity 2.3 Drive loader, select and modify the operating technique to meet changing work conditions 2.4 Monitor and manage equipment performance using indicators and alarms, and ensure efficiency of operation 2.5 Continually monitor hazards and risks, and ensure safety of self, other personnel, plant and equipment 2.6 Complete the work plan, within the operating capacities of the equipment
3. Carry out operator maintenance	3.1 Prepare machine for maintenance 3.2 Conduct inspection and fault finding 3.3 Carry out scheduled maintenance tasks 3.4 Return machine to service 3.5 Process written maintenance records
4. Conduct housekeeping activities	4.1 Clear work area and dispose of or recycle materials 4.2 Manage and/or report hazards, and maintain a safe working environment 4.3 Process written records

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Foundation Skills

Foundation skills essential to performance are explicit in the performance criteria of this unit. Further information is available in the Resources and Infrastructure Industry Training Package Companion Volume.

Unit Mapping Information

RIIMPO304B Conduct wheel loader operations

Links

Companion Volume implementation guides are found in VETNet - https://vetnet.gov.au/Pages/TrainingDocs.aspx?q=88a61002-9a21-4386-aaf8-69c76e675272

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Assessment Requirements for RIIMPO304D Conduct wheel loader operations

Modification History

Release	Comment
1	This unit replaces RIIMPO304B Conduct wheel loader operations. Performance Criteria amended to make requirements more explicit; manoeuvring, driving and parking up added; operator maintenance element added.
2	Modification History information inserted.
3	Knowledge Evidence amended; removed repetition in Performance Criteria; amend reference to Licensing requirements in Unit Application.
4	Required frequency and volume of evidence amended in Performance evidence. Substantial amendments made in Assessment Conditions field, including: references to Industry Sectors, assessor and subject matter expert experience requirements, how assessment should be conducted and what it should confirm.
5	Performance Criteria 1.4 and 1.8 were repetitive, removal of 1.8.

Performance Evidence

Evidence is required to be collected that demonstrates a candidate's competency in this unit. Evidence must be relevant to the roles within this sector's work operations and satisfy all of the requirements of the performance criteria of this unit and include evidence that the candidate:

- locates and applies relevant documentation, policies and procedures
- implements the requirements, procedures and techniques for the safe, effective and efficient completion of wheel loader operations including:
  - conducting prestart checks prior to commencing operations and shutdown procedures on completion of operations
  - carrying out vehicle refuelling requirements and procedures
  - applying safe work practices and identifying and reporting all potential hazards, risks and environmental issues
  - applying problem solving and troubleshooting techniques
  - conducting bucket loading and discharge
  - selecting and using the required tools and equipment
  - inspection and preparation of work area
  - working safely around other machines and personnel

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- works effectively with others to undertake and complete wheel loader operations that meet all of the required outcomes including:
  - using a range of communications techniques and equipment to convey information to others
  - maintaining written and verbal reporting requirements and procedures
- demonstrates completion of conducting wheel loader operations that safely, effectively and efficiently meets all of the required outcomes on more than one (1) occasion including:
  - driving and operating the wheel loader for operations adjusting equipment operations to suit site conditions
  - shifting loads, carries the load as close to the ground as possible and deposits load to the correct location
  - selecting, removing and fitting attachments
  - following the steps to shut down the wheel loader

Knowledge Evidence

The candidate must demonstrate knowledge of the following when conducting wheel loader operations:

- identifying equipment processes, technical capability and limitations
- identifying, interpreting and using geological and technical data (basic)
- identifying signs of operator fatigue and how it should be managed identifying
- apply loading techniques
- interpreting plans, reports, maps, specifications
- applying operational, maintenance and basic diagnostics
- completing housekeeping activities

Assessment Conditions

- An assessor of this unit must satisfy the requirements of the NVR/AQTF or their successors; and Industry regulations for certification and licensing; and,
- this unit must be assessed in the context of this sector's work environment; and,
- this unit must be assessed in compliance with relevant legislation/regulation and using policies, procedures, processes and operational manuals directly related to the industry sector for which it is being assessed; and,
- assessment may be conducted in conjunction with the assessment of other Units of Competency; and,
- assessment must confirm consistent performance can be applied in a range of relevant workplace circumstances; and,
- assessors must demonstrate the performance evidence, and knowledge evidence as outlined in this Unit of Competency, and through the minimum years of current* work experience specified below in an Industry sector relevant to the outcomes of the unit; or,

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- where the assessor does not meet experience requirements a co-assessment or partnership arrangement must exist between the qualified assessor and an Industry subject matter expert. The Industry subject matter expert should hold the unit being assessed (or an equivalent unit) and/or demonstrate equivalence of skills and knowledge at the unit level. An Industry technical expert must also demonstrate skills and knowledge from the minimum years of current work experience specified below in the Industry sector, including time spent in roles related to the unit being assessed; and,
- assessor and Industry subject matter expert requirements differ depending on the Australian Qualifications Framework Level (AQF) of the qualification being assessed and/or Industry Sector as follows:

Industry sector	**AQF** Level**	**Required assessor or Industry subject matter expert experience**
Drilling, Metalliferous Mining, Coal Mining, Extractive (Quarrying) and Civil Construction	1	1 Year
	2	2 Years
Drilling, Coal Mining and Extractive (Quarrying)	3-6	3 Years
Metalliferous Mining and Civil Construction	3-6	5 Years
Other sectors	Where this Unit is being assessed outside of the Resources and Infrastructure Sectors assessor and/or Industry subject matter expert experience should be in-line with industry standards for the sector in which it is being assessed and where no Industry standard is specified should comply with any relevant regulation.	

*Assessors can demonstrate current work experience through employment within Industry in a role relevant to the outcomes of the Unit; or, for external assessors this can be demonstrated through exposure to Industry by conducting frequent site assessments across various locations.

**Where a unit is being delivered outside of a Qualification the first numeric character in the Unit code should be considered to indicate the AQF level

Links

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RIIMPO308E Conduct tracked dozer operations

Modification History

Release	Comment
1	This unit replaces RIIMPO308D Conduct tracked dozer operations. Performance evidence amended. Mapping table added.

Application

This unit describes a participant's skills and knowledge required to conduct tracked dozer operations in coal and metalliferous mining and extractive.

This unit is appropriate for those working in operational roles.

Licensing, legislative, regulatory and certification requirements that apply to this unit can vary between states, territories, and industry sectors. Relevant information must be sourced prior to application of the unit.

Unit Sector

Coal mining

Extractive

Metalliferous mining

Elements and Performance Criteria

1. Plan and prepare for tracked dozer operations	1.1 Access, interpret and apply tracked dozer operations documentation and ensure the work activity is compliant 1.2 Obtain, read, interpret clarify and confirm work plan 1.3 Identify and address risks, hazards and environmental issues and implement control measures 1.4 Select and wear personal protective equipment appropriate for work activities 1.5 Access, interpret and apply geological and survey data required to complete the allocated job 1.6 Inspect and prepare work area in coordination with others 1.7 Obtain and interpret emergency procedures, and be prepared for fire/accident/emergency

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2. Operate the tracked dozer	2.1 Carry out pre-start, start-up, park-up, shutdown, and secure equipment procedures 2.2 Determine equipment capacity and operate equipment within capacity 2.3 Coordinate activities with others at the site prior to commencement of, and during, the work activity 2.4 Drive dozer, select and modify the operating technique to meet changing work conditions 2.5 Monitor and manage equipment performance using indicators and alarms, and ensure efficiency of operation 2.6 Connect and tow/push equipment and plant within the equipment and connection capacity 2.7 Continually monitor hazards and risks, and ensure safety of self, other personnel, plant and equipment
3. Carry out operator maintenance	3.1 Prepare machine for maintenance 3.2 Conduct inspection and fault finding 3.3 Carry out scheduled maintenance tasks 3.4 Return machine to service 3.5 Process written maintenance records
4. Conduct housekeeping activities	4.1 Clear work area and dispose of or recycle materials 4.2 Process records

Foundation Skills

Foundation skills essential to performance are explicit in the performance criteria of this unit. Further information is available in the Resources and Infrastructure Industry Training Package Companion Volume.

Unit Mapping Information

Code and title current version	**Code and title previous version**	**Comments**	**Equivalence status**
RIIMPO308E Conduct tracked dozer operations	RIIMPO308D Conduct tracked dozer operations	Performance evidence amended	Equivalent

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Links

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Assessment Requirements for RIIMPO308E Conduct tracked dozer operations

Modification History

Release	Comment
1	This unit replaces RIIMPO308D Conduct tracked dozer operations. Performance evidence amended. Mapping table added.

Performance Evidence

Evidence is required to be collected that demonstrates a candidate's competency in this unit. Evidence must be relevant to the roles within this sector's work operations and satisfy all of the requirements of the performance criteria of this unit and include evidence that the candidate:

- locates and applies relevant documentation, policies and procedures
- implements the requirements, procedures and techniques for the safe, effective and efficient completion of tracked dozer operations including:
  - conducting prestart checks prior to commencing operations and shutdown procedures on completion of operations
  - carrying out vehicle refuelling requirements and procedures
  - driving and operating the equipment to site conditions
  - applying safe work practices and identifying and reporting all potential hazards, risks and environmental issues
  - applying problem solving and troubleshooting techniques
  - carrying out towing and pushing of equipment and plant
  - selecting and using the required tools and equipment
  - working safely around other machines, infrastructure and personnel
- works effectively with others to undertake and complete tracked dozer operations that meet all of the required outcomes including:
  - using a range of communications techniques and equipment to convey information to others
  - maintaining written and verbal reporting requirements and procedures
  - communicating clearly and concisely with others to receive and clarify work instructions
- demonstrates completion of conducting tracked dozer operations that safely, effectively and efficiently meets all of the required outcomes on more than one (1) occasion including:
  - manoeuvring dozer

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- using blade
- using ripper
- towing and pushing
- building and maintaining stockpiles
- carrying and placing materials
- working safely around:
  - high bench walls
  - other machines and personnel

Knowledge Evidence

The candidate must demonstrate knowledge of the following when conducting tracked dozer operations:

- isolation procedures
- equipment processes, technical capability and limitations
- interpretation of plans, reports, maps, specifications
- geological and technical data (basic)
- signs of operator fatigue and how it should be managed
- dozer operational procedures and techniques (including towing and pushing)
- operational maintenance and basic diagnostics
- housekeeping activities

Assessment Conditions

- Assessors must satisfy the Standards for Registered Training Organisations (RTOs) 2015/AQTF mandatory competency requirements for assessors; and industry regulations for certification and licensing: and,
- this unit must be assessed in the context of this sector's work environment; and,
- this unit must be assessed in compliance with relevant legislation/regulation and using policies, procedures, processes and operational manuals directly related to the industry sector for which it is being assessed; and,
- assessment may be conducted in conjunction with the assessment of other units of competency; and,
- assessment must confirm consistent performance can be applied in a range of relevant workplace circumstances; and,
- assessors must demonstrate the performance evidence, and knowledge evidence as outlined in this unit of competency, and through the minimum years of current* work experience specified below in an industry sector relevant to the outcomes of the unit; or,

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- where the assessor does not meet experience requirements a co-assessment or partnership arrangement must exist between the qualified assessor and an industry subject matter expert. The industry subject matter expert should hold the unit being assessed (or an equivalent unit) and/or demonstrate equivalence of skills and knowledge at the unit level. An industry technical expert must also demonstrate skills and knowledge from the minimum years of current work experience specified below in the industry sector, including time spent in roles related to the unit being assessed; and,
- assessor and industry subject matter expert requirements differ depending on the Australian Qualifications Framework Level (AQF) of the qualification being assessed and/or industry sector as follows:

Industry sector	**AQF** Level**	**Required assessor or industry subject matter expert experience**
Drilling, Metalliferous Mining, Coal Mining, Extractive (Quarrying) and Civil Construction	1	1 Year
	2	2 Years
Drilling, Coal Mining and Extractive (Quarrying)	3-6	3 Years
Metalliferous Mining and Civil Construction	3-6	5 Years
Other sectors	Where this unit is being assessed outside of the Resources and Infrastructure Sectors, assessor and/or industry subject matter expert experience should be in-line with industry standards for the sector in which it is being assessed and, where no industry standard is specified, should comply with any relevant regulation.	

*Assessors can demonstrate current work experience through employment within industry in a role relevant to the outcomes of the unit; or, for external assessors this can be demonstrated through exposure to industry by conducting frequent site assessments across various locations.

**Where a unit is being delivered outside of a qualification the first numeric character in the unit code should be considered to indicate the AQF level.

Links

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RIIMPO309E Conduct wheeled dozer operations

Modification History

Release	Comment
1	This unit replaces RIIMPO309D Conduct wheeled dozer operations. Performance evidence removal of specific sectors and irrelevant demonstration activities. Grammatical updates. Added mapping table.

Application

This unit describes a participant's skills and knowledge required to conduct wheeled dozer operations in coal and metalliferous mining, civil construction and extractive.

This unit is appropriate for those working in operational roles.

Licensing, legislative, regulatory and certification requirements that apply to this unit can vary between states, territories, and industry sectors. Relevant information must be sourced prior to application of the unit.

Unit Sector

Civil construction

Coal mining

Extractive

Metalliferous mining

Elements and Performance Criteria

1. Plan and prepare for wheeled dozer operations	1.1 Access, interpret and apply wheeled dozer operations documentation and ensure the work activity is compliant 1.2 Obtain, read, interpret, clarify and confirm work requirements 1.3 Identify and address risks, hazards and environmental issues and implement control measures 1.4 Select and wear personal protective equipment appropriate for work activities 1.5 Access, interpret and apply geological and survey data required to complete the allocated work 1.6 Inspect and prepare work area in coordination with others

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	1.7 Obtain and interpret emergency procedures, and be prepared for fire/accident/emergency
2. Operate wheeled dozer	2.1 Coordinate activities with others at the site prior to commencement of, and during the work activity 2.2 Carry out pre-start, start-up, park-up shutdown and secure equipment procedures 2.3 Control speed and articulated steering of the wheeled dozer during tramming operations 2.4 Use dozer controls and functions effectively, including manoeuvre attachments to complete tasks 2.5 Carry out towing of equipment and plant safely within equipment and/or connection capabilities 2.6 Maintain safe grip, traction and productivity in varied operating conditions 2.7 Continually monitor hazards and risks, and ensure safety of self, other personnel, plant and equipment 2.8 Complete work plan, within the operating capacities of equipment
3. Carry out operator maintenance	3.1 Prepare machine for maintenance 3.2 Conduct inspection and fault finding 3.3 Carry out scheduled maintenance tasks 3.4 Return the machine to service 3.5 Process written maintenance records
4. Conduct housekeeping activities	4.1 Clear work area and dispose of or recycle materials 4.2 Process records

Foundation Skills

Foundation skills essential to performance are explicit in the performance criteria of this unit. Further information is available in the Resources and Infrastructure Industry Training Package Companion Volume.

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Unit Mapping Information

Code and title current version	**Code and title previous version**	**Comments**	**Equivalence status**
RIIMPO309E Conduct wheeled dozer operations	RIIMPO309D Conduct wheeled dozer operations	Performance evidence removal of specific sectors and irrelevant demonstration activities. Grammatical updates. Add mapping table.	Equivalent

Links

Companion Volume implementation guides are found in VETNet - https://vetnet.gov.au/Pages/TrainingDocs.aspx?q=88a61002-9a21-4386-aaf8-69c76e675272

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Assessment Requirements for RIIMPO309E Conduct wheeled dozer operations

Modification History

Release	Comment
1	This unit replaces RIIMPO309D Conduct wheeled dozer operations. Performance evidence removal of specific sectors and irrelevant demonstration activities. Grammatical updates. Added mapping table.

Performance Evidence

Evidence is required to be collected that demonstrates a candidate's competency in this unit. Evidence must be relevant to the roles within this sector's work operations and satisfy all of the requirements of the performance criteria of this unit and include evidence that the candidate:

- locates and applies relevant documentation, policies and procedures
- implements the requirements, procedures and techniques for the safe, effective and efficient completion of wheeled dozer operations including:
  - conducting prestart checks prior to commencing operations and shutdown procedures on completion of operations
  - carrying out vehicle refuelling requirements and procedures
  - driving and operating the equipment to site conditions
  - applying safe work practices and identifying and reporting all potential hazards, risks and environmental issues
  - applying problem solving and troubleshooting techniques
  - carrying out towing and pushing of equipment and plant
  - selecting and using the required tools and equipment
  - working safely around other machines, infrastructure and personnel
- works effectively with others to undertake and complete wheeled dozer operations that meet all of the required outcomes including:
  - using a range of communications techniques and equipment to convey information to others
  - maintaining written and verbal reporting requirements and procedures
  - communicating clearly and concisely with others to receive and clarify work instructions
- demonstrates completion of wheeled dozer operations that safely, effectively and efficiently meets all of the required outcomes on more than one (1) occasion including:
  - completing a minimum of three (3) of the following wheeled dozer operations:

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    - manoeuvring dozer
    - blade application
    - ripper application
    - towing and pushing
    - pushing and preparing overburden
    - bench and pad preparation
    - trimming and cutting
    - building and maintaining stockpiles
    - supporting other vehicles
    - creation of windrows
    - dump establishment
    - road works
    - contours
    - batters
    - rehabilitation and drainage
    - final landform and the interpretation of associated survey pegs
    - sealing tailing dams
- working safely around:
    - overhead power lines
    - other machines and personnel

Knowledge Evidence

The candidate must demonstrate knowledge of the following when conducting wheeled dozer operations:

- isolation procedures
- equipment processes, technical capability and limitations
- interpretation of plans, reports, maps, specifications
- geological and technical data (basic)
- signs of operator fatigue and how it should be managed
- dozer operational procedures and techniques (including towing and pushing)
- operational, maintenance and basic diagnostics
- housekeeping activities

Assessment Conditions

- Assessors must satisfy the Standards for Registered Training Organisations (RTOs) 2015/AQTF mandatory competency requirements for assessors; and industry regulations for certification and licensing; and,
- this unit must be assessed in the context of this sector’s work environment; and,

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- this unit must be assessed in compliance with relevant legislation/regulation and using policies, procedures, processes and operational manuals directly related to the industry sector for which it is being assessed; and,
- assessment may be conducted in conjunction with the assessment of other units of competency; and,
- assessment must confirm consistent performance can be applied in a range of relevant workplace circumstances; and,
- assessors must demonstrate the performance evidence, and knowledge evidence as outlined in this unit of competency, and through the minimum years of current* work experience specified below in an industry sector relevant to the outcomes of the unit; or,
- where the assessor does not meet experience requirements a co-assessment or partnership arrangement must exist between the qualified assessor and an industry subject matter expert. The industry subject matter expert should hold the unit being assessed (or an equivalent unit) and/or demonstrate equivalence of skills and knowledge at the unit level. An industry technical expert must also demonstrate skills and knowledge from the minimum years of current work experience specified below in the industry sector, including time spent in roles related to the unit being assessed; and,
- assessor and industry subject matter expert requirements differ depending on the Australian Qualifications Framework Level (AQF) of the qualification being assessed and/or industry sector as follows:

Industry sector	**AQF** Level**	**Required assessor or industry subject matter expert experience**
Drilling, Metalliferous Mining, Coal Mining, Extractive (Quarrying) and Civil Construction	1	1 Year
	2	2 Years
Drilling, Coal Mining and Extractive (Quarrying)	3-6	3 Years
Metalliferous Mining and Civil Construction	3-6	5 Years
Other sectors	Where this unit is being assessed outside of the Resources and Infrastructure Sectors, assessor and/or industry subject matter expert experience should be in-line with industry standards for the sector in which it is being assessed and, where no industry standard is specified, should comply with any relevant regulation.	

*Assessors can demonstrate current work experience through employment within industry in a role relevant to the outcomes of the unit; or, for external assessors this can be demonstrated through exposure to industry by conducting frequent site assessments across various locations.

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**Where a unit is being delivered outside of a qualification the first numeric character in the unit code should be considered to indicate the AQF level.

Links

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RIIMPO318E Conduct civil construction skid steer loader operations

Modification History

Release	Comment
1	This unit replaces RIIMPO318D Conduct civil construction skid steer loader operations. Performance criteria 3.3 and 5.2 amended. Element 5 title amended. Amendments made to performance and knowledge evidence. All changes were minor in relation to lifting, attachments, refuelling and relocating plant.

Application

This unit describes the skills and knowledge required to conduct civil construction skid steer loader operations in civil construction.

This unit is appropriate for those working in operational roles.

Licensing, legislative, regulatory and certification requirements that apply to this unit can vary between states, territories, and industry sectors. Relevant information must be sourced prior to application of the unit.

Unit Sector

Civil construction

Elements and Performance Criteria

1. Plan and prepare for skid steer loader operations	1.1 Access, interpret and apply skid steer loader operations documentation and ensure the work activity is compliant 1.2 Obtain, read, interpret, clarify and confirm work requirements 1.3 Identify and address risks, hazards and environmental issues and implement control measures 1.4 Select and wear personal protective equipment appropriate for work activities 1.5 Obtain, identify and implement traffic signage requirements 1.6 Select, and check for faults, equipment and/or attachments for work activities 1.7 Obtain and interpret emergency procedures, and be prepared

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	for fire/accident/emergency
2. Operate skid steer loader	2.1 Carry out pre-start, start-up, park, shutdown and secure equipment procedures 2.2 Coordinate activities with others at the site prior to commencement of, and during, the work activity 2.3 Continually monitor hazards and risks, and ensure safety of self, other personnel, plant and equipment 2.4 Drive and operate loader, and modify the operating technique to meet changing work conditions 2.5 Complete work plan within the operating capacity of the equipment 2.6 Act on or report monitoring systems and alarms
3. Load, carry and place materials	3.1 Conduct communication practices associated with transportation and lifting of materials 3.2 Establish weight of load and ensure it is within safe operational limits of the machine 3.3 Select, appropriate attachment and/or required equipment in accordance with safe working load requirements 3.4 Position machinery to ensure stability and locate to effectively shift materials according to job specifications 3.5 Shift load safely and effectively 3.6 Move load using hand/audible/communication signals
4. Select, remove and fit attachments	4.1 Select attachment for the task 4.2 Remove and fit attachment 4.3 Test attachment and ensure correct fitting and operation 4.4 Use attachment in accordance with recommendations and design limits 4.5 Clean and store removed attachments in designated location
5. Prepare to relocate the skid steer loader	5.1 Prepare for relocation of skid steer loader 5.2 Move skid steer loader safely within and/or between work areas, observing relevant codes and traffic management requirements 5.3 Load and unload machine from float/trailer
6. Carry out machine operator maintenance	6.1 Prepare machine for maintenance 6.2 Conduct inspection and fault finding 6.3 Carry out scheduled maintenance tasks

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	6.4	Process written maintenance records
7. Conduct housekeeping activities	7.1	Clear work area and dispose of or recycle materials
	7.2	Process records

Foundation Skills

Foundation skills essential to performance are explicit in the performance criteria of this unit. Further information is available in the Resources and Infrastructure Industry Training Package Companion Volume.

Unit Mapping Information

Code and title current version	**Code and title previous version**	**Comments**	**Equivalence status**
RIIMPO318E Conduct civil construction skid steer loader operations	RIIMPO318D Conduct civil construction skid steer loader operations	Minor amendments made to element title, two performance criteria, performance and knowledge evidence.	Equivalent

Links

Companion Volume implementation guides are found in VETNet - https://vetnet.gov.au/Pages/TrainingDocs.aspx?q=88a61002-9a21-4386-aaf8-69c76e675272

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Assessment Requirements for RIIMPO318E Conduct civil construction skid steer loader operations

Modification History

Release	Comment
1	This unit replaces RIIMPO318D Conduct civil construction skid steer loader operations. Performance criteria 3.3 and 5.2 amended. Element 5 title amended. Amendments made to performance and knowledge evidence. All changes were minor in relation to lifting, attachments, refuelling and relocating plant.

Performance Evidence

Evidence is required to be collected that demonstrates a candidate's competency in this unit. Evidence must be relevant to the roles within this sector's work operations and satisfy all of the requirements of the performance criteria of this unit and include evidence that the candidate:

- locates and applies relevant documentation, policies and procedures
- implements the requirements, procedures and techniques for the safe, effective and efficient completion of civil construction skid steer loader operations including:
  - conducting prestart checks prior to commencing operations and shutdown procedures on completion of operations
  - driving and operating the equipment to site conditions
  - applying safe work practices and identifying and reporting all potential hazards, risks and environmental issues
  - applying problem solving and troubleshooting techniques
  - applying levelling techniques
  - selecting and using the required tools and equipment
  - working safely around other machines and personnel
  - safely parking and securing equipment
  - applying methods of changing machine attachments
- works effectively with others to undertake and complete civil construction skid steer loader operations that meet all of the required outcomes including:
  - using a range of communications techniques and equipment to convey information to others
  - maintaining written and verbal reporting requirements and procedures
  - organising work activities to meet all task requirements
  - communicating clearly and concisely with others to receive and clarify work instructions

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- demonstrates completion of conducting civil construction skid steer loader operations that safely, effectively and efficiently meets all of the required outcomes on more than one (1) occasion including:
  - completion of operations to specification using a variety of material types including:
    - stripping/spreading topsoil and materials
    - backfilling
    - lifting, loading vehicles
    - excavations
    - mixing materials
    - site clean-up
  - selecting, fitting, testing, using and removing a minimum of one (1) of the following attachments:
    - multipurpose bucket
    - forks
    - dozer blade
    - backhoe
    - auger
    - chain digger
    - power broom
    - profiler
    - tiller/mixer
    - rotary hoe
    - hammer
    - asphalt cutter/saw
    - concrete cutter/saw
    - rake

Knowledge Evidence

The candidate must demonstrate knowledge of the following when conducting civil construction skid steer loader operations:

- ground conditions
- isolation procedures
- equipment processes, technical capability and limitations
- preparation for fire/accident/emergency
- signs of operator fatigue and how it should be managed
- interpretation of drawings and sketches
- site isolation and traffic control responsibilities and authorities
- Civil construction terminology
- project quality requirements
- basic principles of soil technology and soil compaction for civil works

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- basic earthworks calculations
- Civil construction activity sequences of road construction, earthworks and drainage
- methods for calculating safe working loads
- operational, maintenance and basic diagnostics
- housekeeping activities
- vehicle refuelling requirements and procedures

Assessment Conditions

- Assessors must satisfy the Standards for Registered Training Organisations (RTOs) 2015/AQTF mandatory competency requirements for assessors; and industry regulations for certification and licensing; and,
- this unit must be assessed in the context of this sector's work environment; and,
- this unit must be assessed in compliance with relevant legislation/regulation and using policies, procedures, processes and operational manuals directly related to the industry sector for which it is being assessed; and,
- assessment may be conducted in conjunction with the assessment of other units of competency; and,
- assessment must confirm consistent performance can be applied in a range of relevant workplace circumstances; and,
- assessors must demonstrate the performance evidence, and knowledge evidence as outlined in this unit of competency, and through the minimum years of current* work experience specified below in an industry sector relevant to the outcomes of the unit; or,
- where the assessor does not meet experience requirements a co-assessment or partnership arrangement must exist between the qualified assessor and an industry subject matter expert. The industry subject matter expert should hold the unit being assessed (or an equivalent unit) and/or demonstrate equivalence of skills and knowledge at the unit level. An industry technical expert must also demonstrate skills and knowledge from the minimum years of current work experience specified below in the industry sector, including time spent in roles related to the unit being assessed; and,
- assessor and industry subject matter expert requirements differ depending on the Australian Qualifications Framework Level (AQF) of the qualification being assessed and/or industry sector as follows:

Industry sector	**AQF** Level**	**Required assessor or industry subject matter expert experience**
Drilling, Metalliferous Mining, Coal Mining, Extractive (Quarrying) and Civil Construction	1	1 Year
	2	2 Years
Drilling, Coal Mining and Extractive (Quarrying)	3-6	3 Years
Metalliferous Mining and Civil Construction	3-6	5 Years

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Other sectors	Where this unit is being assessed outside of the Resources and Infrastructure Sectors, assessor and/or industry subject matter expert experience should be in-line with industry standards for the sector in which it is being assessed and, where no industry standard is specified, should comply with any relevant regulation.

*Assessors can demonstrate current work experience through employment within industry in a role relevant to the outcomes of the unit; or, for external assessors this can be demonstrated through exposure to industry by conducting frequent site assessments across various locations.

**Where a unit is being delivered outside of a qualification the first numeric character in the unit code should be considered to indicate the AQF level.

Links

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RIIMPO319D Conduct backhoe/loader operations

Modification History

Release	Comment
1	This unit replaces RIIMPO319A Conduct backhoe loader operations.
2	Amended Performance Evidence and Performance Criteria; amend reference to Licensing requirements in Unit Application.
3	Required frequency and volume of evidence amended in Performance evidence. Substantial amendments made in Assessment Conditions field, including: references to Industry Sectors, assessor and subject matter expert experience requirements, how assessment should be conducted and what it should confirm.

Application

This unit describes a participant's skills and knowledge required to conduct backhoe/loader operations in Civil construction.

This unit is appropriate for those working in operational roles.

Licensing, legislative, regulatory and certification requirements that apply to this unit can vary between states, territories, and Industry sectors. Relevant information must be sourced prior to application of the unit.

Unit Sector

Civil construction

Elements and Performance Criteria

1. Plan and prepare for backhoe/loader operations	1.1 Access, interpret and apply backhoe/loader operations documentation and ensure the work activity is compliant 1.2 Obtain, read, interpret, clarify and confirm work instructions 1.3 Identify and address risks, hazards and environmental issues and implement control measures 1.4 Select and wear personal protective equipment appropriate for work activities 1.5 Identify, obtain and implement signage traffic management

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	requirements 1.6 Select, and check for faults, equipment and/or attachments for work activities 1.7 Obtain and interpret emergency procedures, and be prepared for fire/accident/emergency
2. Operate backhoe/ loader	2.1 Carry out pre-start, start-up, park, shutdown and secure equipment procedures 2.2 Coordinate activities with others at the site prior to commencement of, and during, the work activity 2.3 Continually monitor hazards and risks , and ensure safety of self, other personnel, plant and equipment 2.4 Drive and operate machine, and modify the operating technique to meet changing work conditions 2.5 Complete work plan within the operating capacity of the equipment 2.6 Act on or report monitoring systems and alarms
3. Load, carry and place materials	3.1 Conduct communication practices associated with transportation and lifting of materials 3.2 Establish weight of load and ensure it is within safe operational limits of the machine 3.3 Select, attach and apply slings and lifting gear in accordance with safe working load requirements 3.4 Position and locate machinery to ensure stability to effectively shift materials according to job specifications 3.5 Shift load safely and effectively 3.6 Move load using hand/audible/communication signals
4. Select, remove and fit attachments	4.1 Select attachment for the task 4.2 Remove and fit attachment 4.3 Test attachment and ensure correct fitting and operation 4.4 Use attachment in accordance with recommendations and design limits 4.5 Clean and store removed attachments in designated location
5. Relocate the backhoe/ loader	5.1 Prepare backhoe/loader for relocation 5.2 Move backhoe/loader safely between worksites, observing relevant codes and traffic management requirements
6. Carry out machine	6.1 Prepare machine for maintenance

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operator maintenance	6.2	Conduct inspection and fault finding
	6.3	Carry out scheduled maintenance tasks
	6.4	Process written maintenance records
7. Clean up	7.1	Clear work area and dispose of or recycle materials
	7.2	Process records

Foundation Skills

Foundation skills essential to performance are explicit in the performance criteria of this unit. Further information is available in the Resources and Infrastructure Industry Training Package Companion Volume.

Unit Mapping Information

RIIMPO319A Conduct backhoe loader operations

Links

Companion Volume implementation guides are found in VETNet - https://vetnet.gov.au/Pages/TrainingDocs.aspx?q=88a61002-9a21-4386-aaf8-69c76e675272

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Assessment Requirements for RIIMPO319D Conduct backhoe/loader operations

Modification History

Release	Comment
1	This unit replaces RIIMPO319A Conduct backhoe loader operations.
2	Amended Performance Evidence and Performance Criteria; amend reference to Licensing requirements in Unit Application.
3	Required frequency and volume of evidence amended in Performance evidence. Substantial amendments made in Assessment Conditions field, including: references to Industry Sectors, assessor and subject matter expert experience requirements, how assessment should be conducted and what it should confirm.

Performance Evidence

Evidence is required to be collected that demonstrates a candidate's competency in this unit. Evidence must be relevant to the roles within this sector's work operations and satisfy all of the requirements of the performance criteria of this unit and include evidence that the candidate:

- locates and applies relevant documentation, policies and procedures
- implements the requirements, procedures and techniques for the safe, effective and efficient completion of backhoe/ loader operations including:
  - conducting prestart checks prior to commencing operations and shutdown procedures on completion of operations
  - carrying out vehicle refuelling requirements and procedures
  - driving and operating the equipment to site conditions
  - applying safe work practices and identifying and reporting all potential hazards, risks and environmental issues
  - applying problem solving and troubleshooting techniques
  - applying leveling techniques
  - selecting and using the required tools and equipment
  - working safely around other machines and personnel
  - safely parking and securing of equipment
  - applying methods of changing machine attachments
- works effectively with others to undertake and complete backhoe/ loader operations that meet all of the required outcomes including:

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- using a range of communications techniques and equipment to convey information to others
- maintaining written and verbal reporting requirements and procedures
- organising work activities to meet all task requirements
- communicating clearly and concisely with others to receive and clarify work instructions

- demonstrates completion of conducting backhoe/loader operations that safely, effectively and efficiently meets all of the required outcomes on more than one (1) occasion including:
  - completion of operations to specification using a variety of material types including:
    - mixing materials
    - stripping/spreading topsoils and materials
    - trench excavation
    - backfilling
    - lifting and carrying materials
    - loading dump trucks, wagons, hoppers, chutes, and cutting/boxing
  - fitting and removal a variety of attachments selected from the following:
    - extending devices
    - tilt bucket
    - buckets
    - compaction wheel
    - ripper
    - plate compactor
    - rock breaker
    - auger
    - broom
    - mower/slasher
    - forklift
    - 4 in 1 bucket and free/rock grab

Knowledge Evidence

The candidate must demonstrate knowledge of the following when conducting backhoe/loader operations:

- identifying, interpreting ground conditions
- communicating and performing isolation procedures
- identifying equipment processes, technical capability and limitations
- being prepared for fire/accident/emergency
- identifying signs of operator fatigue and how it should be managed
- interpreting drawings and sketches
- identifying site isolation and traffic control responsibilities and authorities

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- using civil construction terminology
- complying with project quality requirements
- applying basic principles of soil technology and soil compaction for civil works
- using basic earthworks calculations
- using civil construction activity sequences of road construction, earthworks and drainage
- applying leveling techniques
- using methods for calculating safe working loads
- applying operational, maintenance and basic diagnostics
- completing housekeeping activities

Assessment Conditions

- An assessor of this unit must satisfy the requirements of the NVR/AQTF or their successors; and Industry regulations for certification and licensing; and,
- this unit must be assessed in the context of this sector's work environment; and,
- this unit must be assessed in compliance with relevant legislation/regulation and using policies, procedures, processes and operational manuals directly related to the industry sector for which it is being assessed; and,
- assessment may be conducted in conjunction with the assessment of other Units of Competency; and,
- assessment must confirm consistent performance can be applied in a range of relevant workplace circumstances; and,
- assessors must demonstrate the performance evidence, and knowledge evidence as outlined in this Unit of Competency, and through the minimum years of current* work experience specified below in an Industry sector relevant to the outcomes of the unit; or,
- where the assessor does not meet experience requirements a co-assessment or partnership arrangement must exist between the qualified assessor and an Industry subject matter expert. The Industry subject matter expert should hold the unit being assessed (or an equivalent unit) and/or demonstrate equivalence of skills and knowledge at the unit level. An Industry technical expert must also demonstrate skills and knowledge from the minimum years of current work experience specified below in the Industry sector, including time spent in roles related to the unit being assessed; and,
- assessor and Industry subject matter expert requirements differ depending on the Australian Qualifications Framework Level (AQF) of the qualification being assessed and/or Industry Sector as follows:

Industry sector	**AQF** Level**	**Required assessor or Industry subject matter expert experience**
Drilling, Metalliferous Mining, Coal Mining, Extractive (Quarrying) and Civil Construction	1	1 Year
	2	2 Years

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Drilling, Coal Mining and Extractive (Quarrying)	3-6	3 Years
Metalliferous Mining and Civil Construction	3-6	5 Years
Other sectors	Where this Unit is being assessed outside of the Resources and Infrastructure Sectors assessor and/or Industry subject matter expert experience should be in-line with industry standards for the sector in which it is being assessed and where no Industry standard is specified should comply with any relevant regulation.	

*Assessors can demonstrate current work experience through employment within Industry in a role relevant to the outcomes of the Unit; or, for external assessors this can be demonstrated through exposure to Industry by conducting frequent site assessments across various locations.

**Where a unit is being delivered outside of a Qualification the first numeric character in the Unit code should be considered to indicate the AQF level

Links

Companion Volume implementation guides are found in VETNet - https://vetnet.gov.au/Pages/TrainingDocs.aspx?q=88a61002-9a21-4386-aaf8-69c76e675272

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TAEDEL301 Provide work skill instruction

Modification History

Release	Comments
Release 1	This version first released with *TAE Training and Education Training Package Version 2.0.*

Application

This unit describes the skills and knowledge required to conduct individual and group instruction, demonstrate work skills and assess the success of training and one's own training performance, using existing learning resources in a safe and comfortable learning environment.

It emphasises the training as being driven by the work process and context, and applies to a person working under supervision as a work skill instructor in a wide range of settings not restricted to training organisations,

No licensing, legislative or certification requirements apply to this unit at the time of publication.

Unit Sector

Delivery and facilitation

Elements and Performance Criteria

ELEMENT	PERFORMANCE CRITERIA
Elements describe the essential outcomes.	*Performance criteria describe the performance needed to demonstrate achievement of the element.*
1. Organise instruction and demonstration	1.1 Gather information about learner characteristics and learning needs 1.2 Confirm a safe learning environment 1.3 Gather and check instruction, demonstration objectives, and seek assistance if required 1.4 Access and review relevant learning resources and learning

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ELEMENT	PERFORMANCE CRITERIA
	materials for suitability and relevance, and seek assistance to interpret the contextual application 1.5 Organise access to necessary equipment or physical resources required for instruction and demonstration 1.6 Notify learners of details regarding the implementation of the learning program and/or delivery plan
2. Conduct instruction and demonstration	2.1 Use interpersonal skills with learners to establish a safe and comfortable learning environment 2.2 Follow the learning program and/or delivery plan to cover all learning objectives 2.3 Brief learners on any workplace health and safety (WHS) procedures and requirements prior to, and during, training 2.4 Use delivery techniques to structure, pace and enhance learning 2.5 Apply coaching techniques to assist learning 2.6 Use communication skills to provide information, instruct learners and demonstrate relevant work skills 2.7 Provide opportunities for practice during instruction and through work activities 2.8 Provide and discuss feedback on learner performance to support learning
3. Check training performance	3.1 Use measures to ensure learners are acquiring, and can use, new technical and generic skills and knowledge 3.2 Monitor learner progress and outcomes in consultation with the learner 3.3 Review relationship between the trainer/coach and the learner, and adjust to suit learner needs
4. Review personal training performance	4.1 Reflect upon personal performance in providing instruction and demonstration, and document strategies for improvement 4.2 Maintain, store and secure learner records, according to organisational and legal requirements

Foundation Skills

This section describes language, literacy, numeracy and employment skills incorporated in the performance criteria that are required for competent performance.

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Skill	Performance Criteria	Description
Learning	4.1	• Reflects on practice to improve
Reading	1.1, 1.3, 1.4, 2.2	• Sources and interprets processes and procedures, learning resources and information relevant to providing a work instruction and delivery
Writing	1.4, 1.6, 2.3, 2.6, 2.8, 3.2, 4.1, 4.2	• Accurately maintains learner records and documentation appropriate to the learning context and audience
Oral Communication	1.1, 1.6, 2.3, 2.4, 2.6	• Uses appropriate communication strategies to engage, build rapport, provide instruction, monitor progress and provide feedback to individuals or groups
Interact with others	1.2, 1.3, 2.1, 2.5, 2.8, 3.2	• Recognises the importance of consultation and negotiation while collaborating to confirm strategy and achieve required outcomes • Asks questions in order to clarify understanding, and to provide and seek feedback • Builds rapport to establish effective working relationships and to achieve effective outcomes
Get the work done	1.1-1.6, 2.1-2.8, 3.1-3.3, 4.1, 4.2	• Organises and completes work according to defined requirements, taking responsibility for some decisions and sequencing tasks to achieve efficient outcomes • Identifies and responds to potential risks, problems and opportunities for improvement and considers options for different approaches

Unit Mapping Information

Code and title current version	Code and title previous version	Comments	Equivalence status
TAEDEL301 Provide work skill instruction	TAEDEL301A Provide work skill instruction	Updated to meet Standards for Training Packages	Equivalent unit

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Links

Companion Volume implementation guides are found in VETNet - https://vetnet.gov.au/Pages/TrainingDocs.aspx?q=35337905-785d-4f93-8777-e9991ad4c6c3

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Assessment Requirements for TAEDEL301 Provide work skill instruction

Modification History

Release	Comments
Release 1	This version first released with *TAE Training and Education Training Package Version 2.0.*

Performance Evidence

The candidate must show evidence of the ability to complete tasks outlined in the elements and performance criteria of this unit, including:

- carrying out a minimum of three training sessions, involving demonstrating and instructing particular work skills for at least two different individuals or small groups, with each session addressing:
  - different learning objectives
  - a range of delivery techniques and effective communication skills appropriate to the audience.

Knowledge Evidence

The candidate must be able to demonstrate essential knowledge to effectively complete the task outlined in the elements and performance criteria of this unit. This includes knowledge of:

- learner characteristics and needs
- the content and requirements of the relevant learning program, and/or the delivery plan
- the sources and availability of relevant learning resources and learning materials
- the content of relevant learning resources and learning materials
- training techniques that enhance learning, and when to use them
- introductory knowledge of learning principles and learning styles
- key workplace health and safety (WHS) issues in the learning environment, including:
  - roles and responsibilities of key personnel
  - responsibilities of learners
  - relevant policies and procedures, including hazard identification, risk assessment, reporting requirements, safe use of equipment and emergency procedures
  - risk controls for the specific learning environment.

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Assessment Conditions

Gather evidence to demonstrate consistent performance in conditions that are safe and replicate the workplace. Conditions must be typical of those experienced in the training and assessment environment and include access to any necessary workplace documents.

Assessors must satisfy the requirements for assessors in applicable vocational education and training legislation, frameworks and/or standards.

Links

Companion Volume implementation guides are found in VETNet - https://vetnet.gov.au/Pages/TrainingDocs.aspx?q=35337905-785d-4f93-8777-e9991ad4c6c3

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TLILIC0002 Licence to operate a vehicle loading crane (capacity 10 metre tonnes and above)

Modification History

Release 1. This is the first release of this unit of competency in the TLI Transport and Logistics Training Package.

Application

This unit specifies the skills and knowledge required to safely operate a vehicle loading crane with a Maximum Rated Capacity (MRC) of 10 metre tonnes or more. Competence in this unit, does not in itself result in a HRWL licence to operate this plant.

Vehicle loading crane means a crane mounted on a vehicle for loading and unloading the vehicle.

A person undertaking this unit must hold:

- a current National High-Risk Work Licence (HRWL) to perform dogging or a certification for a specific VET course for HRWL to perform dogging.

A person performing this work is required to hold a vehicle loading crane HRWL.

This unit requires a person operating a slewing vehicle loading crane with an MRC of 10 metre tonnes or more to:

- plan for the work/task
- prepare for the work/task
- perform work/task
- pack up

Licensing/Regulatory Information

Legislative and regulatory requirements are applicable to this unit of competency.

This unit is based on the licensing requirements of Part 4.5 of the Model Work Health and Safety (WHS) Regulations and meets Commonwealth, State and Territory HRWL requirements.

The National Assessment Instrument (NAI) is the mandated assessment for the HRWL to operate the relevant licencing class as detailed in this unit.

Pre-requisite Unit

Not applicable

Competency Field

LIC - Licencing Units

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Unit Sector

Not applicable

Elements and Performance Criteria

ELEMENTS	PERFORMANCE CRITERIA
Elements describe the essential outcomes.	Performance criteria describe the performance needed to demonstrate achievement of the element.
1 Plan work/task	**1.1** Task requirements are identified from work orders or equivalent and a lift plan is confirmed with associated personnel and a site inspection is conducted in accordance with workplace procedures
	1.2 Work area operating surface is confirmed to determine the quality of ground suitability for operational use of vehicle loading crane in accordance with workplace procedures
	1.3 Vehicle loading crane rated capacity (RC) and the lifting gear Working Load Limit (WLL) are established for the load/s and work/task requirements in accordance with manufacturer requirements and workplace procedures
	1.4 Appropriate paths for operating the vehicle loading crane and moving and placing load/s in work area are assessed and determined in accordance with workplace procedures
	1.5 Relevant hazard identification and risk elimination/control measures are applied and advised to associated personnel in accordance with workplace procedures
	1.6 Traffic management plan implementation is confirmed and followed in accordance with workplace procedures
	1.7 Appropriate communication procedures are identified and tested with associated personnel in accordance with workplace procedures

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	1.8	All tasks are confirmed to ensure requirements for the relevant work area in accordance with workplace procedures
Prepare for work/task 2	**2.1**	Consultation with workplace personnel is established and maintained to ensure all crane and lifting operations are clear and consistent with site requirements in accordance with a lift plan and workplace procedures
	2.2	Risk control measures for hazards identified are checked for implementation in accordance with the lift plan and safe work procedures
	2.3	Vehicle loading crane controls are accessed safely in accordance with manufacturer requirements and safe work procedures
	2.4	Pre-start vehicle loading crane checks are carried out and any damage and defects are reported, recorded and appropriate action is taken in accordance with safe work procedures and manufacturer requirements
	2.5	Vehicle loading crane is set up correctly with any lifting gear as per the lift plan in accordance with relevant manufacturer requirements including load chart/s and safe work procedures
	2.6	Boom/jib and lifting gear are set up as required in accordance with specific manufacturer requirements and safe work procedures
	2.7	Vehicle loading crane is stabilised appropriately in accordance with the lift plan, relevant manufacturer requirements and safe work procedures
	2.8	Operational checks are carried out and any damage and defects are reported, recorded and appropriate action is taken in accordance with manufacturer requirements and safe work procedures
	2.9	Vehicle loading crane logbook is inspected and is correct for the crane type, is completed and signed and required rectifications have been signed off in accordance with manufacturer requirements and safe work procedures

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		2.10	Weather and work environment conditions are assessed to determine any impact on vehicle loading crane operations in accordance with manufacturer requirements and safe work procedures
3	**Perform work/task**	**3.1**	Lifts are determined within the RC of the vehicle loading crane in accordance with the load chart/s and lift plan
		3.2	Boom/jib and hook block are safely positioned over the load following directions from associated personnel in accordance with the lift plan and safe work procedures
		3.3	Lifting gear is connected to the load and used safely in accordance with the lift plan, safe work procedures and manufacturer requirements
		3.4	Test lift is carried out in accordance with dogging and safe work procedures
		3.5	Loads are transferred using relevant crane movements and tag lines as required, in accordance with lift plan and safe work procedures
		3.6	Load and crane movement is monitored constantly and crane is operated safely in accordance with lift plan and safe work procedures
		3.7	All required communication signals are correctly interpreted and followed whilst crane is operated in accordance with the lift plan and safe work procedures
		3.8	Load is lowered and landed safely in accordance with lift plan and safe work procedures
		3.9	Lifting gear is disconnected from load and crane is positioned safely and efficiently for next task in accordance with lift plan and safe work procedures
4	**Pack up**	**4.1**	Crane boom/jib, lifting gear and associated equipment is stowed and secured as required in accordance with manufacturer requirements and safe work procedures

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4.2 Relevant motion locks and brakes are applied as required in accordance with manufacturer requirements and safe work procedures

4.3 Stabilisers are stowed and secured in accordance with manufacturer requirements and safe work procedures

4.4 Crane is shut down and secured to prevent unauthorised access/use in accordance with safe work procedures

4.5 Plates or packing are stowed and secured in accordance with safe work procedures

4.6 Shut down crane checks are carried out in accordance with safe work procedures and manufacturer requirements

Foundation Skills

Foundation skills essential to performance are explicit in the performance criteria of this unit of competency

Range of Conditions

Range is restricted to essential operating conditions and any other variables essential to the work environment.

Non -essential conditions may be found in the Companion Volume Implementation Guide.

Unit Mapping Information

This unit replaces and is equivalent to TLILIC0012 Licence to operate a vehicle loading crane (capacity 10 metre tonnes and above)

Links

Companion Volume Implementation Guide - https://vetnet.gov.au/Pages/TrainingDocs.aspx?q=df441c6e-213d-43e3-874c-0b3f7036d851

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Assessment Requirements for TLILIC0002 Licence to operate a vehicle loading crane (capacity 10 metre tonnes and above)

Modification History

Release 1. This is the first release of this unit of competency in the TLI Transport and Logistics Training Package.

Performance Evidence

Evidence required to demonstrate competence in this unit must be relevant to and satisfy all the requirements of the elements and performance criteria on at least one occasion and include:

- applying relevant mathematical calculations in conjunction with lift plan and load chart to determine radius requirements and relevant lifting gear to perform work/task to enable crane to be configured for load including:
  - boom
  - Stabiliser positioning
  - type of hook
- conducting and applying risk and hazard assessment strategies including:
  - confirming work area operating surface suitability based on crane and task requirements
  - dynamic loads
  - ground conditions including condition of surface and slopes
  - load swing
  - overloading
  - lifting and placing load
  - tyre pressures/track condition
  - asymmetric loads
  - overhead hazards including electric lines and service pipes
  - restricted and poorly ventilated areas
  - risk of collision with people, moving plant and fixed structures
  - adequate lighting
  - traffic including pedestrians, vehicles and other plant
  - weather conditions
- confirming and following traffic management plan procedures relevant to their role in the work area
- complying with Commonwealth, state and territory Work Health and Safety (WHS)/Occupational Health and Safety (OHS)/Occupational Safety and Health (OSH) legislation
- communicating with other associated personnel through using appropriate worksite procedures which including:

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  - 2-way radio
  - active listening
  - demonstrating and interpreting hand signals
  - questioning to confirm understanding
  - signage
  - whistles
  - written instructions
- maintaining three points of contact whilst accessing load surface area of vehicle loading crane and ensure rungs / steps are free of hazards
- completing the pre-start check including:
  - engine / mechanical fluid level checks as required by manufacturer requirements
  - presence of correct logbook
  - evidence of damage
  - fluid leaks
  - lights work effectively
  - locating, identifying and confirming all controls
  - fire extinguisher
  - safety equipment checks
  - signage and labels to ensure they are visible and legible
  - checking for signs of paint separation and stressed welds indicating potential structural weakness
  - tyres and wheels for damage/wear and correct inflation
  - updating records as required
  - visual damage or equipment faults
- identifying, isolating, and tagging out defective equipment and reporting to authorised person/s
- inputting crane configuration into crane computer as required and checking operation to accurately reflect crane configuration
- carrying out operational checks ensuring:
  - all controls are located, identified and tested for functionality
  - all hydraulic functions are operated
  - lifting gear movements and control functions are smooth and comply with lift plan
  - hazard warning systems, safety, audible and visual warning devices are checked for to ensure they are functional including:
    - reversing beepers
    - lights
    - horns
  - start-up is in accordance with manufacturer requirements and safe work procedures
  - there are no unusual noises
  - crane control functions comply with operating requirements
- determining any defects or faults with operation of crane and reporting to relevant person/s

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- ensuring risk control measures within the work area are effective as per workplace procedures
- interpreting and confirming relevant documentation for the work task and relevant area
- monitoring load disconnection from hook is safe and ensuring no movement of controls
- applying relevant communication signals from associated personnel
- operating a vehicle loading crane of 10metre tonnes or greater configured to its rated capacity (RC) to lift and move four different loads using the main hook through an obstacle course using all crane operational controls while the load is in full view of the crane operator. Loads must consist of:
  - a load of >50% of the Rated Capacity (RC) of the crane with a boom length of >75%, and
  - a round load with a minimum diameter of 300 mm and minimum length of 3 m that requires a dogger to sling, and
  - an asymmetrical load that requires a dogger to sling, and
  - stillage containing at least ten scaffolding standards or containing a load of steel pipes of equivalent weight that requires a dogger to sling
- applying relevant crane movements including:
  - boom/jib up and down (luffing)
  - catching load swing appropriately
  - positioning and using main and auxiliary hook and lifting gear to connect to load safely
  - raise and lower hoist
  - slew boom/jib
  - telescope in and out
- positioning vehicle loading crane in relevant area for next task
- setting up and validating an exclusion zone
- positioning the vehicle loading crane for safe operation for:
  - application of the task
  - manoeuvring in the workplace
  - stability of the vehicle loading crane and the load
- recording and maintaining accurate information relating to crane operations
- reporting to relevant person/s on site risk control measures that are not in place or deficient
- shutting down a vehicle loading crane in accordance with manufacturer requirements and safe work procedures
- stabilising a vehicle loading crane for operation by:
  - correctly positioning plates or packing
  - deploying stabilisers
  - establishing correct size plates or packing in accordance with lift plan
  - levels are checked
- test-lifting load just clear of lifting plane to allow for checks to be safely made in consultation with associated personnel to ensure:
  - slinging is correct
  - all crane equipment is functioning properly

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  - load centre of gravity is correct
  - loads of unusual shape or weight distribution are correctly slung
- test-lifting load just clear of lifting plane to allow for checks of crane computer (where fitted) to ensure:
  - load measuring equipment can be used to verify calculated weight of load
  - near capacity loads do not overload crane
- using communications signals including:
  - hoist down - hand and whistle and radio
  - hoist up - hand and whistle and radio
  - luff boom down - hand and whistle and radio
  - luff boom up - hand and whistle and radio
  - slew left - hand and whistle and radio
  - slew right - hand and whistle and radio
  - stop - hand and whistle and radio
  - telescope in - hand and whistle and 2-way radio (where manufacturer requirements allow)
  - telescope out - hand and whistle and 2-way radio (where manufacturer requirements allow)

Knowledge Evidence

Evidence required to demonstrate competence in this unit must be relevant to and satisfy all of the requirements of the elements and performance criteria and include knowledge of:

- mathematical calculations to:
  - estimate loads
  - radius requirements
  - relevant lifting gear to perform work/task
- appropriate worksite communication procedures including:
  - listening
  - hand signals
  - questioning techniques
  - signage
  - two-way radios
  - written instructions
  - whistles
- characteristics and impact of factors affecting vehicle loading crane stability whilst moving loads including:
  - overloading
  - poor load placement
  - asymmetric loads
  - tyre deflation/condition

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- crane, lifting gear load chart/s and manufacturer requirements
- lift impacting factors including:
  - centre of gravity
  - dynamic nature of load
  - flex/deflexion of load
  - length
  - radius of lift
  - weight
- set up of:
  - jib
  - fly jib (where fitted)
- hazards including:
  - pack up and crane stability, crane tipping and demolition sites
  - ground stability including ground condition, recently filled trenches and slopes
  - insufficient lighting
  - obstacles or obstruction
  - other specific hazards and dangerous materials
  - overhead hazards including:
    - electric lines
    - service pipes
    - fixed structures
    - vegetation (trees)
  - traffic including pedestrians, vehicles and other plant
  - operations on unusual, uneven or difficult terrains
- manufacturer requirements on stabiliser procedures
- manufacturer requirements and instructions on shutting down and packing up crane
- vehicle loading crane characteristics and capabilities to allow crane configuration to suit a range of loads
- relevant workplace instructions, safety information, emergency procedures
- relevant documentation requirements and procedures for recording, reporting and maintaining workplace records and information
- risk assessment management and mitigation strategies including hierarchy of control:
  - elimination
  - substitution
  - isolation
  - engineering controls
  - administrative controls
  - personal protective equipment (PPE)
- roles and responsibilities of duty holders as per legislative obligations of Work Health and Safety (WHS)/Occupational Health and Safety (OHS)/Occupational Safety and Health (OSH) requirements and safe work / workplace procedures

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- prestart and operational checks required for a vehicle loading crane
- starting procedure of crane as per manufacturer requirements
- weather bureau forecasts and environmental conditions that could impact operation including:
  - lightning
  - wind
  - water impacted ground
  - Ultra Violet (UV) exposure
- problems and appropriate response procedures to unplanned and/or unsafe situations and environmental conditions
- stability of load and avoidance of hazards using best crane practice including:
  - allowing for boom deflection
  - boom/jib as low as possible
  - carrying load near to ground surface
  - crane stability
  - gently accelerating and braking on slew/boom to minimise load swing
  - lowering load safely onto appropriate dunnage taking into consideration swing and restrictions of area
  - minimum boom/jib length
  - minimum speed
  - using handheld taglines as required
  - identification of incorrect sling of load
- workplace standards, requirements, policies and procedures for conducting operations for the vehicle loading crane
- work area suitability based on relevant ground reports including:
  - backfilled ground
  - bitumen
  - concrete
  - hard compacted soil
  - pre-contaminated soils
  - rock
  - rough uneven ground
  - soft soils

Assessment Conditions

As a minimum, assessors must satisfy applicable regulatory requirements, which include requirements in the Standards for Registered Training Organisations current at the time of assessment.

As a minimum, assessment must satisfy applicable regulatory requirements, which include requirements in the Standards for Registered Training Organisations current at the time of

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assessment.

Assessment processes and techniques must be appropriate to the language, literacy and numeracy requirements of the work being performed and the needs of the candidate.

Assessment must occur in workplace operational situations. Where this is not appropriate, assessment must occur in simulated workplace operational situations that reflect workplace conditions.

- Simulators must not be used in the assessment of this unit of competency.

Accredited assessors assessing for this HRWL on behalf of the regulator are responsible for ensuring candidates must have access to resources for assessment that must include access to:

- vehicle loading crane with a MRC of greater than 10 metre tonnes in safe/serviceable working order in accordance with manufacturers specifications
- appropriate loads as outlined in the performance evidence requirements
- appropriate personnel to sling and direct loads including:
  - dogger or rigger
- communications equipment including:
  - two-way radios
  - whistles
- relevant personal protective equipment (PPE)
- relevant documentation for operating a vehicle loading crane with an MRC of greater than 10 metre tonnes including:
  - approved codes of practice and guidance
  - Australian Standards
  - checklists
  - safe work operating procedures
  - relevant industry standards (where applicable)
  - logbook
  - manufacturer guidelines (instructions, specifications or checklists)
  - relevant workplace documentation

Links

Companion Volume Implementation Guide - https://vetnet.gov.au/Pages/TrainingDocs.aspx?q=df441c6e-213d-43e3-874c-0b3f7036d851

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TLILIC0003 Licence to operate a forklift truck

Modification History

Release 1. This is a release of this unit of competency in the TLI Transport and Logistics Training Package.

Application

This unit specifies the skills and knowledge required to operate a forklift truck safely in accordance with all relevant legislative requirements. Competence in this unit, does not in itself result in a HRWL licence to operate this plant.

Forklift truck means a powered industrial truck equipped with lifting media made up of a mast and an elevating load carriage to which is attached a pair of fork arms or other attachments that can be raised 900 mm or more above the ground, but does not include a pedestrian-operated truck or a pallet truck.

A person performing this work is required to hold a forklift truck High Risk Work Licence (HRWL).

This unit requires a person operating a forklift truck to:

- plan for the work/task
- prepare for the work/task
- perform work/task
- pack up

Licensing/Regulatory Information

Legislative and regulatory requirements are applicable to this unit of competency.

This unit is based on the licensing requirements of Part 4.5 of the Model Work Health and Safety (WHS) Regulations and meets Commonwealth, State and Territory HRWL requirements.

The National Assessment Instrument (NAI) is the mandated assessment for the HRWL to operate the relevant licencing class as detailed in this unit.

Pre-requisite Unit

Not applicable

Competency Field

LIC - Licencing Units

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Unit Sector

Not applicable

Elements and Performance Criteria

ELEMENTS	PERFORMANCE CRITERIA
Elements describe the essential outcomes.	Performance criteria describe the performance needed to demonstrate achievement of the element.
1 Plan work/task	**1.1** Task requirements are identified from work orders or equivalent and confirmed with relevant people and site inspection is conducted in accordance with workplace procedures
	1.2 Work area operating surface is assessed to determine suitability for operational use of forklift truck in accordance with workplace procedures
	1.3 Suitability of forklift truck and attachment working load limit (WLL) is determined for the load/s and work/task requirements in accordance with manufacturer requirements and workplace procedures
	1.4 Working area is inspected and appropriate paths for operating the forklift truck and moving and placing load/s in work area are assessed and managed in accordance with workplace procedures
	1.5 Hazard and risk control measures are identified and reported to relevant person/s in accordance with workplace procedures
	1.6 Traffic management plan implementation is confirmed in accordance with workplace procedures
	1.7 Appropriate communication procedures are identified with relevant people in accordance with workplace procedures
	1.8 All work is confirmed to ensure coverage of work/task requirements for the relevant work area is in accordance with workplace procedures

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2	**Prepare for work/task**	**2.1** Consultation with workplace person/s is maintained to ensure workplan is clear and consistent with site requirements in accordance with safe work procedures
		2.2 Weather and work environmental conditions are assessed to determine any impact on forklift truck operations in accordance with manufacturer requirements and safe work procedures
		2.3 Risk control measures for hazards identified are checked for implementation in accordance with safe work procedures
		2.4 Forklift truck is accessed in a safe manner in accordance with manufacturer requirements and workplace procedures
		2.5 Forklift truck logbook is checked in accordance with manufacturer, regulatory requirements and safe work procedures
		2.6 Pre-start checks are carried out and any damage and defects are reported, recorded and appropriate action is taken in accordance with safe work procedures and manufacturer requirements
		2.7 Forklift truck is set up correctly with any relevant attachments as per work plan in accordance with relevant manufacturer requirements including data plate and safe work procedures
		2.8 Operational checks are carried out and any damage and defects are reported, recorded and appropriate action is taken in accordance with manufacturer requirements and safe work procedures
		2.9 Hazard and risk control measures are checked for implementation and communicated to people in the work area in accordance with safe work procedures
3	**Perform work/task**	**3.1** Weight and positioning of load is assessed to ensure compliance with forklift truck data plate requirements and in accordance with safe work procedures

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	3.2	Forklift truck is operated safely in accordance with manufacturer requirements and safe work procedures
	3.3	Loads are monitored constantly when lifting, moving, lowering and placing to ensure stability of load and avoidance of hazards in accordance with safe work procedures
	3.4	Unplanned and unsafe situations are responded to in accordance with safe work procedures
	3.5	Loads are picked up, transported and placed using all forklift truck movements in accordance with safe work procedures
	3.6	Forklift truck is parked, switched off and isolated appropriately in accordance with manufacturer requirements and safe work procedures
4 Pack Up	**4.1**	Forklift truck shutdown procedures are carried out in accordance with manufacturer requirements and safe work procedures
	4.2	Forklift truck is secured to prevent unauthorised access/use in accordance with safe work procedures

Foundation Skills

Foundation skills essential to performance are explicit in the performance criteria of this unit of competency

Range of Conditions

Range is restricted to essential operating conditions and any other variables essential to the work environment.

Non-essential conditions may be found in the Companion Volume Implementation Guide.

Unit Mapping Information

This unit replaces and is equivalent to TLILIC2001 Licence to operate a forklift truck

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Links

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Assessment Requirements for TLILIC0003 Licence to operate a forklift truck

Modification History

Release 1. This is the first release of this unit of competency in the TLI Transport and Logistics Training Package.

Performance Evidence

Evidence required to demonstrate competence in this unit must be relevant to and satisfy all the requirements of the elements and performance criteria on at least one occasion and include:

- applying safe operating procedures for a forklift truck including:
  - maintaining safe operating speed
  - travelling with load lowered to an appropriate height for the terrain, operating surface and visibility in relation to direction of travel
- applying relevant forklift truck manufacturer requirements and data plate information and approved modifications to attachments fitted are in accordance with manufacturer requirements
- carrying out pre-start checks, including visual inspection which must include:
  - battery charge as required by manufacturer requirements
  - checking and interpreting data plate/s are relevant to the attachment and the forklift truck
  - checking for signs of paint separation and stressed welds indicating potential structural weakness
  - document evidence of damage
  - engine / mechanical fluid level checks including fuel as required by manufacturer requirements
  - ensuring availability of correct forklift truck logbook and updating records as required
  - ensuring forklift truck tynes or other attachment/s are securely fitted
  - ensuring seat and mirrors are adjusted appropriately and seat belt is functional
  - fluid leaks
  - lights are working effectively
  - safety equipment checks
  - signage and labels to ensure they are visible and legible
  - wheels and tyres for damage/correct inflation if applicable
- conducting and applying risk and hazard assessment strategies including:
  - insufficient lighting
  - other specific hazards including dangerous goods
  - overhead hazards and fixed structures, roof beams and doorways
  - restricted and poorly ventilated areas

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  - surface suitability based on forklift truck and task requirements
  - the risk of collision with people, moving plant and fixed structures
  - weather conditions
- complying with Commonwealth, State and Territory Work Health and Safety (WHS)/Occupational Health and Safety (OHS)/Occupational Safety and Health (OSH) legislation, regulations safe work and workplace procedures
- conducting operational checks, which must ensure:
  - all controls are located, identified and tested for functionality
  - all hydraulic functions operated to maximum extension and ensuring attachment (if fitted) movements and control functions are smooth and comply with operating requirements
  - hazard warning systems (e.g. reversing beepers, lights and horns) are functional
  - recording and maintaining accurate information relating to forklift truck operations
  - safety devices as fitted
  - start-up is in accordance with manufacturer requirements
  - steering, transmission and brake functions comply with operating requirements
  - there are no unusual noises
- confirming and following traffic management plan procedures relevant to their role in the work area
- conducting relevant procedures for refuelling and isolating fuel/power source as per manufacturer requirements using appropriate PPE
- determining relevant lifting attachment to perform work/task
- determining lift requirements including:
  - positioning of unusually balanced/shaped loads
  - centre of gravity
  - dynamic nature of load
  - tyne/attachment positioning
  - weight
- ensuring risk control measures within the work area are effective as per workplace procedures
- identifying, isolating and tagging out defective equipment and reporting to authorised person/s
- interpreting and confirming relevant documentation, workplace instructions, safety information, emergency procedures for the work task and relevant area
- interpreting workplace procedures in relation to various environmental conditions
- maintaining communication with other workplace personnel through using worksite procedures including:
  - audible and visual warning devices
  - signage
  - two-way radio
  - verbal instructions
  - written instructions
- maintaining three points of contact whilst accessing and egressing forklift truck and ensuring

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rungs / steps are free of hazards
- operating and monitoring safe forklift truck operations using minimum 250kg dynamic and non-dynamic loads that include:
  - aligning tynes/attachment to load
  - carrying out a lift to 75% of the maximum height
  - conducting trial lift to ensure forklift truck and load are stable, and load is safe to move
  - correctly using horns and mirrors in workplace
  - correctly positioning and using an observer to assist when operating with a load that may restrict vision or be placed out of vision of the operator
  - driving applicable to conditions and moving loads safely
  - driving a forklift truck safely with load in forward and reverse, while maintaining visibility through an obstacle course including:
    - an 'S' bend with a minimum 90 degrees left and right turn
    - ensuring load/s remains stable through pick up, transport and placement
    - forklift truck speed is appropriate to load and surroundings
    - lowering dynamic and non-dynamic loads to appropriate height for travel in forward and reverse
  - picking up, driving, manoeuvring and placing dynamic and non-dynamic loads safely at various heights within a compliant racking system
  - picking up, driving, manoeuvring and placing dynamic and non-dynamic loads safely into/onto an elevated, flat, stable area
  - tilting mast (or forks if applicable) to ensure balance of load
  - using gluts/dunnage appropriately and lowering load safely
  - using tilt and side shift (where fitted) safely to manoeuvre dynamic and non-dynamic loads into allocated space
- reporting to relevant person/s on site risk control measures that are not in place or are deficient
- setting up an exclusion zone
- securely parking forklift truck and isolating in appropriate position including:
  - minimising possible access by unauthorised person/s
  - tynes/attachment lowered to required position in accordance with manufacturer requirements
  - park brake applied
  - switching off, isolating fuel/power source and removing key according to workplace procedures
- shutting down a forklift truck in accordance with manufacturer requirements and workplace procedures

Knowledge Evidence

Evidence required to demonstrate competence in this unit must be relevant to and satisfy all of the requirements of the elements and performance criteria and include knowledge of:

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- Australian and industry standards, codes of practice and guidelines to safely operate a forklift truck
- communication procedures including:
  - audible and visual warning devices
  - hand signals
  - questioning techniques
  - signage
  - traffic warning systems
  - two-way radio
  - written instructions
- forklift truck characteristics and capabilities, manufacturer requirements and instructions for any attachments
- impact of the following on the operation of the forklift truck including:
  - failure/loss of control including brakes and steering
  - failure of equipment during forklift truck operations
  - forklift truck instability causes including:
    - deterioration of ground condition
    - overloading
    - pick up and placement of load
    - irregular loads
  - operating on ramps and uneven surfaces and in restricted spaces
  - use of forklift truck data plate and attachment data plate and appropriate methodology to determine weight of a load is appropriate for forklift truck and any attachment if fitted including the estimation or determination from:
    - labels on the actual load
    - markings on the actual load
    - paperwork such as consignment notes, running sheets and weighbridge dockets
    - weighing a carton and calculating load
- manufacturer requirements, instructions and operator's manual
- problems, and appropriate response procedures to unplanned and/or unsafe environmental conditions including:
  - wind
  - lightning
  - water/ice impacted surface/ground
  - rain
  - extreme heat
  - Ultra violet (UV) exposure
- problems and equipment faults, and implementing appropriate response procedures to unplanned and/or unsafe situations including:
  - lock out and tag out procedures
- relevant procedures for refuelling and recharging forklift truck using appropriate PPE

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including:

- gas bottle
- connecting battery to charger and disconnecting battery from charger and reconnecting to forklift truck
- refuelling

- procedures for recording, reporting and maintaining workplace records and information
- risk assessment process including hierarchy of control:
  - elimination
  - substitution
  - isolation
  - engineering controls
  - administrative controls
  - personal protective equipment (PPE)
- safe use and compliance of different types of attachments including:
  - bale clamps
  - carpet spike for carpet rolls
  - drum carrier
  - jib attachment
  - paper roll clamps
  - personnel work platforms
  - rotators
  - slippers/fork extensions on tynes
- suitability and lifting capability of the attachment to be used
- shut down procedures for a forklift truck in accordance with manufacturer requirements
- traffic management plan procedures and requirements
- typical routine problems encountered operating a forklift truck and associated equipment, and adjustments required for correction
- workplace procedures including work plan which may be verbal, documented/written, or electronically generated
- work area operating surface suitability including issues with:
  - backfilled ground
  - bitumen (damaged, cracked)
  - concrete (damaged, cracked)
  - hard compacted soil
  - potholes
  - railway tracks
  - rough uneven or difficult terrain including sloping surfaces, uneven surfaces, steel decks and grates
  - soft soils
  - trench covers
- Work Health and Safety (WHS)/Occupational Health and Safety (OHS)/Occupational Safety

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and Health (OSH) requirements, safe work and workplace procedures

Assessment Conditions

As a minimum, assessors must satisfy applicable regulatory requirements, which include requirements in the Standards for Registered Training Organisations current at the time of assessment.

As a minimum, assessment must satisfy applicable regulatory requirements, which include requirements in the Standards for Registered Training Organisations current at the time of assessment.

Assessment processes and techniques must be appropriate to the language, literacy and numeracy requirements of the work being performed and the needs of the candidate.

Assessment must occur in workplace operational situations. Where this is not appropriate, assessment must occur in simulated workplace operational situations that reflect workplace conditions.

- Simulators must not be used in the assessment of this unit of competency.

Resources for assessment must include access to:

- a suitable forklift truck that complies with AS 2359 Powered industrial trucks and is in a safe/serviceable condition in accordance with manufacturer requirements
- associated equipment for forklift truck operations
- suitable dynamic and non-dynamic loads
- suitable compliant racking system
- relevant and appropriate materials, tools, equipment and personal protective equipment currently used in industry
- applicable documentation including:
  - approved codes of practice and relevant guidance material
  - relevant Australian technical standards
  - manufacturer guidelines (instructions, requirements or checklists), relevant industry standards and operating procedures (where applicable)

Links

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TLILIC0005 Licence to operate a boom-type elevating work platform (boom length 11 metres or more)

Modification History

Release 1. This is the first release of this unit of competency in the TLI Transport and Logistics Training Package.

Application

This unit specifies the skills and knowledge required to safely operate a boom-type Elevating Work Platform (EWP) where the length of the boom is 11 metres or more in accordance with all relevant legislative requirements. Competence in this unit, does not in itself result in a HRWL licence to operate this plant.

Boom-type elevating work platform means a telescoping device, hinged device, or articulated device, or any combination of these, used to support a platform on which personnel, equipment and materials may be elevated.

A person performing this work is required to hold a boom-type elevating work platform High Risk Work Licence (HRWL).

This unit requires a person operating an EWP to:

- plan for the work/task
- prepare for the work/task
- perform work/task
- pack up

Licensing/Regulatory Information

Legislative and regulatory requirements are applicable to this unit of competency.

This unit is based on the licensing requirements of Part 4.5 of the Model Work Health and Safety (WHS) Regulations and meets Commonwealth, State and Territory HRWL requirements.

The National Assessment Instrument (NAI) is the mandated assessment for the HRWL to operate the relevant licencing class as detailed in this unit.

Pre-requisite Unit

Not applicable

Competency Field

LIC - Licencing Units

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Unit Sector

Not applicable

Elements and Performance Criteria

ELEMENTS	PERFORMANCE CRITERIA
Elements describe the essential outcomes.	Performance criteria describe the performance needed to demonstrate achievement of the element.
1 Plan work/task	**1.1** Task requirements are identified from work orders or equivalent and confirmed with relevant people and a site inspection is completed in accordance with workplace procedures
	1.2 Work area ground/operating surface is assessed to determine suitability for operational use of EWP in accordance with manufacturer requirements and workplace procedures
	1.3 EWP capabilities are established for the load/s and work/task requirements in accordance with manufacturer requirements and workplace procedures
	1.4 Appropriate paths for operating the EWP and moving in work area are assessed and determined in accordance with workplace procedures
	1.5 Relevant hazard and risk control measures are applied and advised to relevant person/s in accordance with workplace procedures
	1.6 Traffic management plan implementation is confirmed in accordance with workplace procedures
	1.7 Appropriate communication procedures are identified, with relevant people in accordance with workplace procedures

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	1.8	All work is confirmed to ensure coverage of work/task requirements for the relevant work area in accordance with workplace procedures
2 Prepare for work/task	**2.1**	Consultation with workplace person/s is maintained to ensure workplan is clear and consistent with site requirements in accordance with workplace procedures
	2.2	Risk control measures for hazards identified are checked for implementation in accordance with workplace procedures
	2.3	Safety equipment including Personal Protective Equipment (PPE) are inspected, fitted correctly and used in accordance with manufacturer requirements and safe work procedures
	2.4	EWP is accessed in a safe manner in accordance with manufacturer requirements and safe work procedures
	2.5	Pre-start EWP checks are carried out in accordance with manufacturers requirements and safe work procedures
	2.6	EWP is started and is checked for any abnormal noises in accordance safe work procedures
	2.7	EWP is positioned correctly as per work plan in work area in accordance with relevant manufacturer requirements and safe work procedures
	2.8	EWP is stabilised appropriately in accordance with the workplan, relevant manufacturer requirements and safe work procedures
	2.9	Operational checks from base controls are carried out in accordance with relevant manufacturer requirements and safe work procedures
	2.10	All platform controls are located, identified and tested in accordance with manufacturer requirements and safe work procedures

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	2.11	All damage and defects are reported and appropriate action is taken to rectify in accordance with manufacturer requirements and safe work procedures
	2.12	EWP logbook is inspected and is correct for the EWP, is completed and signed in accordance with manufacturer requirements and safe work procedures
	2.13	Weather and work environmental conditions are assessed to determine any impact on EWP operation and positioning as per workplan in accordance with manufacturer requirements and safe work procedures
3 Perform work/task	**3.1**	Relevant hazard prevention/control measures identified are checked for implementation in accordance with safe work procedures
	3.2	EWP is safely located at point of work in work area in accordance with safe work procedures
	3.3	EWP platform is positioned for work tasks and stability and all operations are monitored constantly in accordance with safe work procedures
	3.4	Work gear and tools are stowed and secured in accordance with safe work procedures
	3.5	EWP is operated using all movements in accordance with safe work procedures and manufacturer requirements
	3.6	Unplanned and unsafe situations are responded to in accordance with safe work procedures
	3.7	All communication signals are correctly interpreted and followed whilst EWP is operated in accordance with safe work procedures
	3.8	EWP platform is accessed and egressed in accordance with safe work procedures and manufacturer requirements

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	3.9	EWP is parked, switched off and isolated appropriately in accordance with manufacturer requirements and safe work procedures
4 Pack up	**4.1**	Post-operational EWP checks are carried out in accordance with manufacturer requirements and safe work procedures
	4.2	EWP boom is retracted, lowered, stowed and secured in accordance with manufacturer requirements and safe work procedures
	4.3	Safety equipment and PPE is disconnected from platform in accordance with safe work procedures
	4.4	Relevant motion locks and brakes are applied as required in accordance with manufacturer requirements and safe work procedures
	4.5	Outriggers and/or stabilisers, plates or packing if fitted are stowed and secured in accordance and with manufacturer requirements and safe work procedures
	4.6	EWP is shut down in accordance with manufacturer requirements and safe work procedures

Foundation Skills

Foundation skills essential to performance are explicit in the performance criteria of this unit of competency

Range of Conditions

Range is restricted to essential operating conditions and any other variables essential to the work environment.

Non-essential conditions may be found in the Companion Volume Implementation Guide.

Unit Mapping Information

This unit replaces and is equivalent to TLILIC2005 Licence to operate a boom-type elevating work platform (boom length 11 metres or more)

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Assessment Requirements for TLILIC0005 Licence to operate a boom-type elevating work platform (boom length 11 metres or more)

Modification History

Release 1. This is the first release of this unit of competency in the TLI Transport and Logistics Training Package.

Performance Evidence

Evidence required to demonstrate competence in this unit must be relevant to and satisfy all the requirements of the elements and performance criteria on at least one occasion and include:

- advising relevant person/s on site in relation to the risk hazard prevention/ control strategies
- applying safe operating and best mobiling practice and procedures for an Elevating Work Platform (EWP) including all functions within the safe working rated capacity including:
  - boom/s as low as possible and fully retracted whilst travelling
  - boom/s in line with EWP where practical whilst travelling
  - EWP stability
  - gently accelerating and braking to minimise boom/s swing
  - maintaining safe operating speed in relation to the work condition
  - travelling with work platform raised to an appropriate height for the terrain and visibility in relation to direction of travel
- applying emergency procedures
- applying traffic management plan procedures relevant to their role in the work area
- carrying out pre-start checks, including visual inspection which must include:
  - battery fluid level as required by manufacturer requirements
  - checking compliance plate is relevant to the load/s being used on the EWP
  - engine / mechanical fluid level checks as required by manufacturer requirements
  - ensuring availability of correct logbook and updating records as required
  - ensuring EWP platform and attachment/s fitted in platform are secured
  - evidence of damage
  - fluid leaks
  - lights are working effectively (where fitted)
  - safety equipment checks
  - signage and labels to ensure they are visible and legible
  - structural weaknesses including paint separation or stressed welds
  - wheels and tyres for damage/correct inflation if applicable
- carrying out operational checks on EWP including:

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  - testing of all EWP safety devices
  - all controls are located, identified and tested for functionality from the base controls and platform controls
  - hazard warning systems including travel beepers and lights are functional
  - start-up is in accordance with manufacturer requirements
  - steering, transmission and brake functions comply with operating requirements
  - there are no unusual noises
- checking compliance plate and load chart for reach requirements and load suitability
- controlling and operating a boom type elevating work platform ensuring movements and control functions are safe, smooth and comply with operating requirements including:
  - any combination of the movement of the extending structures used to support a platform on which personnel, equipment and materials are elevated to perform the work task/s
  - avoidance of ground depressions
  - correctly using observer guidance of work platform, main chassis and extending structure
  - demonstrating best mobiling practice driving an EWP in forward and reverse, while maintaining visibility
  - driving applicable to conditions and moving platform and load/s safely
  - ensuring warning devices are functioning correctly
  - interpreting directional arrows correctly on platform controls during forward, reverse, left and right
  - lowering boom to its resting position
  - monitoring platform, main chassis and extending structure movement constantly ensuring safe work procedures are followed
  - raising platform and slewing within manufacturer requirements
  - raising platform to a minimum height of 11 metres or 75% of the maximum height capacity (whichever is greater)
  - stability of the EWP and the work platform
  - telescoping in and out and positioning platform to perform work task/s safely whilst at a minimum height of 75% of the maximum capacity
- conducting and applying risk/hazard assessment strategies including:
    - barricades and controls to prevent the risk of collision with people, moving vehicles and fixed structures
    - disconnected power
    - environmental conditions including:
      - wind
      - lightning
      - water impacted ground
      - rain
      - extreme heat
      - Ultra Violet (UV) exposure
    - ground conditions (surface and slopes) and assessing work area operating surface

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suitability based on machine and task requirements
    - insulated electric lines
    - overhead hazards including electric lines and service pipes
    - personal protective equipment (PPE)
    - restricted areas and crush points from work platform and external surroundings
    - safety related tags on electrical switches/isolators that have an impact on point of work of EWP operator
    - sufficient lighting
    - suitable area for set-up, positioning and safely operating EWP
    - suitable firm and stable operating surface
    - use of safety observer when visibility is restricted
- clarifying workplan and checking understanding
- complying with Commonwealth, State and Territory Work Health and Safety (WHS)/Occupational Health and Safety (OHS)/Occupational Safety and Health (OSH) legislation and regulations
- inspecting and using relevant safety equipment, including:
    - anchor point/s
    - emergency retrieval system from base controls and platform controls where fitted
    - energy absorber/s
    - lanyard/s
    - safety harness/es
- identifying, isolating and tagging out defective equipment and reporting to authorised person/s
- interpreting and confirming relevant documentation, workplace instructions, safety information and emergency procedures for the work task and relevant area
- interpreting workplace procedures in relation to various work environmental conditions
- maintaining communication with other workplace personnel using appropriate workplace procedures including procedures to ensure all movements are conveyed clearly and succinctly including:
    - 2-way radio
    - audible and visual warning devices
    - making and interpreting hand signals
    - questioning to confirm understanding
    - signage
    - written instructions
- entering work platform correctly including:
    - lowering platform safely and stably to appropriate height to access safely
    - unclipping of fall restraint/arrest device
    - maintaining three points of contact whilst accessing platform
- exiting work platform correctly including:
    - lowering platform safely and stably to appropriate height to egress safely

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    - unclipping of fall restraint/arrest device
    - exiting platform maintaining three points of contact
- recording and maintaining accurate information relating to EWP operations
- using and interpreting EWP manufacturer requirements and data, including compliance plate and load chart, to enable correct EWP selection for task including:
    - boom/s
    - jib
    - platform
    - weight including:
        - outrigger load or wheel load
- reporting to relevant person/s on site risk control measures that are not in place or deficient
- stabilising procedures for an EWP including:
    - checking levels
    - removing obstacles and obstructions
    - deploying and retracting outriggers
    - establishing correct size plates for packing (if required)
- shutting down a boom type EWP in accordance with manufacturer requirements and workplace procedures

Knowledge Evidence

Evidence required to demonstrate competence in this unit must be relevant to and satisfy all of the requirements of the elements and performance criteria and include knowledge of:

- Australian and industry standards, codes of practice and guidelines to safely operate an EWP (boom length 11 metres or more) including:
    - nominal reach, measured horizontally from centre point of rotation to outer edge of platform in its most extended position
    - vertical distance from floor of platform to surface supporting elevating work platform with platform at its maximum height
- appropriate mathematical calculations to estimate loads ensuring EWP is not overloaded
- appropriate worksite communication procedures including:
    - 2-way radio
    - audible and visual warning devices
    - questioning techniques
    - signage
    - hand signals
    - traffic warning systems
    - written instructions
- compliance with permit condition requirements including:
    - from electrical supply authority
    - if operating on roads or footpaths

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- EWP characteristics and capabilities, manufacturer requirements and instructions
- hazards including:
  - all ground and /or operating surface hazards
  - traffic including pedestrians, vehicles, other mobile plant and building structures
  - overhead hazards including electric lines, service pipes, doorways, roof beams, and lights
  - obstacles or obstructions
  - insufficient lighting
  - other relevant hazards
- impact of the following on the operation of the EWP including:
  - failure/loss of control including brakes and steering
  - failure of equipment including hydraulic system
  - EWP and platform instability due to:
    - deterioration of ground/operating surface condition
    - gradient of operating surface
    - overloading
    - poor load placement
    - irregular loads
  - emergency procedures and safety equipment, including the use of:
    - safety harness/es
    - energy absorbers
    - lanyard/s
    - anchor point/s
    - emergency retrieval systems
- identification and avoidance of person/s potential crush or entrapment points
- identification and avoidance of potential contact with overhead electrical conductor's
- identification and avoidance of potential contact with structures near work platform/boom or chassis
- relevant manufacturer requirements and instructions
- problems, and appropriate response procedures to unplanned and/or unsafe environmental conditions
- relevant procedures for refuelling/recharging EWP using appropriate PPE
- procedures for recording, reporting and maintaining workplace records and information
- risk assessment process including hierarchy of control:
  - elimination
  - substitution
  - isolation
  - engineering controls
  - administrative controls
  - personal protective equipment (PPE)
- procedures for shutting down a boom type EWP in accordance with manufacturer requirements

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- problems and equipment faults, and implementing appropriate response procedures to unplanned and/or unsafe situations
- relevant documentation requirements
- suitability and lifting capability of the EWP to be used
- lock out and tag out procedures
- traffic management plan procedures and requirements
- typical routine problems encountered operating a EWP and adjustments required for correction
- wind speed factors that affect stability of EWP as per manufacturer requirements
- work plan which may be verbal, documented/written, or electronically generated
- work area operating surface suitability including issues with:
  - backfilled ground
  - bitumen (damaged, cracked)
  - concrete (damaged, cracked)
  - hard compacted soil
  - potholes
  - railway tracks
  - rough uneven or difficult terrain including sloping surfaces, uneven surfaces, steel decks and grates
  - soft soils
  - trench covers
- Work Health and Safety (WHS)/Occupational Health and Safety (OHS)/Occupational Safety and Health (OSH) and codes of practice requirements for boom type elevating work platforms

Assessment Conditions

As a minimum, assessors must satisfy applicable regulatory requirements, which include requirements in the Standards for Registered Training Organisations current at the time of assessment.

As a minimum, assessment must satisfy applicable regulatory requirements, which include requirements in the Standards for Registered Training Organisations current at the time of assessment.

Assessment processes and techniques must be appropriate to the language, literacy and numeracy requirements of the work being performed and the needs of the candidate.

Assessment must occur in workplace operational situations. Where this is not appropriate, assessment must occur in simulated workplace operational situations that reflect workplace conditions.

- Simulators must not be used in the assessment of this unit of competency

Resources for assessment must include access to:

- appropriate boom-type elevating work platform (boom length 11 metres or more) in a

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safe/serviceable condition in accordance with manufacturer requirements
- relevant and appropriate materials, tools, equipment and personal protective equipment currently used in industry
- applicable documentation including:
  - approved codes of practice and guidance material
  - relevant Australian technical standards
  - manufacturer guidelines (instructions, requirements or checklists) for performance assessment
  - relevant industry standards and operating procedures (where applicable)
  - relevant workplace documentation.

Links

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TLILIC0008 Licence to operate a non-slewing mobile crane (greater than 3 tonnes capacity)

Modification History

Release 1. This is the first release of this unit of competency in the TLI Transport and Logistics Training Package.

Application

This unit specifies the skills and knowledge required to operate a non-slewing mobile crane with a Maximum Rated Capacity (MRC) exceeding 3 tonnes safely, in accordance with all relevant legislative responsibilities. Competence in this unit, does not in itself result in a HRWL licence to operate this plant.

A person undertaking this unit must hold:

- a current National High-Risk Work Licence (HRWL) or a certification for a specific VET course for HRWL to perform dogging

Non-slewing mobile crane means a mobile crane incorporating a boom or jib that cannot be slewed, and includes:

- an articulated mobile crane
- a locomotive crane
- but does not include vehicle tow trucks.

A person performing this work is required to hold a non-slewing mobile crane HRWL.

This unit requires a person operating non-slewing mobile crane with an MRC exceeding 3 tonnes to:

- plan the work/task
- prepare for the work/task
- perform work/task
- pack up

Licensing/Regulatory Information

Legislative and regulatory requirements are applicable to this unit of competency. This unit is based on the licensing requirements of Part 4.5 of the Model Work Health and Safety (WHS) Regulations and meets Commonwealth, State and Territory HRWL requirements.

The National Assessment Instrument (NAI) is the mandated assessment for the HRWL to operate the relevant licencing class as detailed in this unit.

Pre-requisite Unit

Not applicable

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Competency Field

LIC - Licencing Units

Unit Sector

Not applicable

Elements and Performance Criteria

ELEMENTS	PERFORMANCE CRITERIA
Elements describe the essential outcomes.	Performance criteria describe the performance needed to demonstrate achievement of the element.
1 Plan work/task	**1.1** Task requirements are identified from work orders or equivalent and a lift plan is confirmed with associated personnel and a site inspection is conducted in accordance with workplace procedures
	1.2 Work area operating surface is confirmed to determine the quality of ground suitability for operational use of non-slewing mobile crane in accordance with workplace procedures
	1.3 Non-slewing mobile crane rated capacity (RC) and the lifting gear Working Load Limit (WLL) are established for the load/s and work/task requirements in accordance with manufacturer requirements and workplace procedures
	1.4 Appropriate paths for operating the mobile crane and moving and placing load/s in work area are assessed and determined in accordance with workplace procedures
	1.5 Relevant hazard identification and risk elimination/control measures are applied and advised to associated personnel in accordance with workplace procedures
	1.6 Traffic management plan implementation is confirmed and followed in accordance with workplace procedures
	1.7 Appropriate communication procedures are identified and tested with associated personnel in accordance with workplace procedures

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	1.8	All tasks are confirmed to ensure requirements for the relevant work area in accordance with a lift plan and workplace procedures
2 Prepare for work/task	**2.1**	Consultation with workplace personnel is established and maintained to ensure lift plan is clear and consistent with site requirements in accordance with a lift plan and workplace procedures
	2.2	Risk control measures for hazards identified are checked for implementation in accordance with the lift plan and safe work procedures
	2.3	Non-slewing mobile crane is accessed safely in accordance with manufacturer requirements and safe work procedures
	2.4	Pre-start crane checks are carried out and any damage and defects are reported, recorded and appropriate action is taken in accordance with manufacturer requirements and safe work procedures
	2.5	Mobile crane is set up correctly with any lifting gear as per the lift plan in accordance with relevant manufacturer requirements including load chart/s and safe work procedures
	2.6	Fly jib (if fitted) is set up as required in accordance with specific manufacturer requirements and safe work procedures
	2.7	Operational checks are carried out and any damage and defects are reported, recorded and appropriate action is taken in accordance with manufacturer requirements and safe work procedures
	2.8	Crane logbook is checked to confirm current compliance, is correct for the crane type, is completed and signed and required rectifications have been signed off in accordance with manufacturer requirements and safe work procedures
	2.9	Weather and work environment conditions are assessed to determine any impact on mobile crane operations in accordance with manufacturer requirements and safe work procedures
3 Perform work/task	**3.1**	Lifts are determined within the RC of the non slewing mobile crane in accordance with the load chart/s and lift

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		plan
	3.2	Boom/jib and hook block is safely positioned over the load following directions from associated personnel in accordance with the lift plan and safe work procedures
	3.3	Lifting gear where required is connected to the load and used safely in accordance with the lift plan, safe work procedures and manufacturer requirements
	3.4	Test lift is carried out in accordance with dogging and safe work procedures
	3.5	Loads are transferred using relevant crane movements and tag lines as required, in accordance with lift plan and safe work procedures
	3.6	Load and crane movement is monitored constantly and crane is operated safely in accordance with lift plan and safe work procedures
	3.7	All required communication signals are correctly interpreted and followed whilst crane is operated in accordance with the lift plan and safe work procedures
	3.8	Load is lowered and landed safely in accordance with lift plan and safe work procedures
	3.9	Lifting gear is disconnected from load and crane is positioned safely and efficiently for next task in accordance with lift plan and safe work procedures
4 Pack Up	**4.1**	Crane boom/jib, lifting gear and associated equipment is stowed and secured as required in accordance with manufacturer requirements and safe work procedures
	4.2	Relevant motion locks and brakes are applied as required in accordance with manufacturer requirements and safe work procedures
	4.3	Crane is shut down and secured to prevent unauthorised access/use in accordance with safe work procedures
	4.4	Post-operational crane checks are carried out in accordance with legislative responsibilities, safe work procedures and manufacturer requirements

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Foundation Skills

Foundation skills essential to performance are explicit in the performance criteria of this unit of competency

Range of Conditions

Range is restricted to essential operating conditions and any other variables essential to the work environment.

Non -essential conditions may be found in the Companion Volume Implementation Guide.

Unit Mapping Information

This unit replaces and is equivalent to TLILIC3006 Licence to operate a non-slewing mobile crane (greater than 3 tonnes)

Links

Companion Volume Implementation Guide - https://vetnet.gov.au/Pages/TrainingDocs.aspx?q=df441c6e-213d-43e3-874c-0b3f7036d851

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Assessment Requirements for TLILIC0008 Licence to operate a non-slewing mobile crane (greater than 3 tonnes capacity)

Modification History

Release 1. This is the first release of this unit of competency in the TLI Transport and Logistics Training Package.

Performance Evidence

Evidence required to demonstrate competence in this unit must be relevant to and satisfy all the requirements of the elements and performance criteria on at least one occasion and include:

- applying relevant mathematical calculations in conjunction with lift plan and load chart, radius requirements and relevant lifting gear to perform work/task to enable crane to be configured for load including:
  - boom
  - fly-jib (where fitted)
  - line pull
  - mobiling
  - type of hook
  - side slope derations
  - articulation derations
- applying relevant crane movements including:
  - boom/jib up and down (luffing)
  - positioning and using main and auxiliary hook and lifting gear to connect to load safely
  - raise and lower hoist
  - telescope in and out
  - travel and articulating (as required)
- communicating with other workplace personnel through using appropriate worksite procedures including:
  - 2-way radio
  - listening
  - making and interpreting hand signals
  - questioning to confirm understanding
  - signage
  - verbal language
  - visual aids
  - whistles
  - written instructions
- complying with Commonwealth, state and territory Work Health and Safety

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(WHS)/Occupational Health and Safety (OHS)/Occupational Safety and Health (OSH) legislation and safe work procedures

- completing the pre-start check including:
  - battery power level as required by manufacturer requirements
  - engine / mechanical fluid level checks as required by manufacturer requirements
  - presence of correct logbook
  - evidence of damage
  - fluid leaks
  - lights work effectively
  - locating, identifying and confirming all controls
  - mirrors and seat are adjusted appropriately
  - safety equipment checks
  - signage and labels to ensure they are visible and legible
  - checking for signs of paint separation and stressed welds indicating potential structural weakness
  - tyres and wheels for damage/wear and correct inflation (Water/Air)
  - updating records as required
  - visual damage or equipment faults
- conducting and applying risk and hazard strategies including:
  - confirming work area operating surface suitability based on crane and task requirements
  - articulation of crane
  - dynamic loads
  - ground conditions including surface and slopes
  - impact of tyre inflation/condition
  - load swing
  - overloading
  - pick and placement of load
  - asymmetric loads
  - overhead hazards
  - restricted site/s and poorly ventilated area/s
  - risk of collision with people, moving plant and fixed structures
  - adequate lighting
  - weather conditions
- completing operational checks ensuring:
  - all controls are located, identified and tested for functionality
  - all hydraulic functions are operated
  - lifting gear movements and control functions are smooth and comply with lift plan
  - hazard warning systems, safety, audible and visual warning devices are checked to ensure they are functional including:
    - reversing beepers

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    - lights
    - horns
    - crane computer alarm (where fitted)
    - anti-two block alarms (where fitted)
  - start-up is in accordance with manufacturer requirements and workplace procedures
  - there are no unusual noises
  - steering, transmission and brake functions comply with operating requirements
- confirming and following traffic management plan procedures relevant to crane operator role in the work area
- determining any defects or faults with operation of crane and reporting to relevant person/s
- ensuring risk control measures within the work area are effective as per workplace procedures
- ensuring stability of load and avoidance of hazards by applying best mobile practice including:
  - allowing for boom deflection
  - boom/jib as low as possible
  - boom/jib in line with crane
  - carrying load near to ground surface
  - crane stability whilst manoeuvring load into position with drive/steering wheels and articulating as required
  - gently accelerating and braking to minimise load swing
  - lowering load safely and stably onto appropriate dunnage taking into consideration swing and restrictions of area
  - minimum boom/jib length
  - minimum speed
  - using handheld taglines/bridling
- following directions of dogger or rigger
- interpreting and confirming relevant documentation for the work task and relevant area
- inputting crane configuration into crane computer (where fitted) and checking operation to accurately reflect crane configuration
- interpreting and acting on communications signals including:
  - hoist down - hand and whistle and radio
  - hoist up - hand and whistle and radio
  - luff boom down - hand and whistle and radio
  - luff boom up - hand and whistle and radio
  - articulate left - hand and whistle and radio
  - articulate right - hand and whistle and radio
  - stop - hand and whistle and radio
  - telescope in - hand and whistle and 2-way radio (where manufacturer requirements allow)
  - telescope out - hand and whistle and 2-way radio (where manufacturer requirements allow)

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  - travel - hand and radio
- maintaining three points of contact whilst accessing crane and ensure rungs / steps are free of hazards
- monitoring load disconnection from hook is safe and ensuring no movement of controls
- observing relevant communication signals from relevant person
- operating an articulated non-slewing mobile crane with a rated capacity (RC) of 12 tonnes or greater to lift four different loads using the main hook through an obstacle course using all crane operational controls while the load is in full view of the crane operator. Loads must consist of:
  - a load of >50% of the Rated Capacity (RC) of the crane with a boom length of >75%, and
  - a round load with a minimum diameter of 300 mm and minimum length of 3 m that requires a dogger to sling, and
  - an asymmetrical load that requires a dogger to sling, and
  - travelling with a load of stillage containing at least ten scaffolding standards or containing a load of steel pipes of equivalent weight that requires a dogger to sling and a boom length of <75%
- positioning the non-slewing mobile crane for safe operation for:
  - application of the task
  - manoeuvring in the workplace
  - aligning of crane boom to the load
  - stability of the non-slewing mobile crane and the load whilst driving to load set down position
- recording and maintaining accurate information relating to crane operations
- reporting to relevant person/s on site risk control measures that are not in place or deficient
- setting up of:
  - fly jib (where fitted)
  - manual boom section (where fitted)
- setting up and validating an exclusion zone
- shutting down a non-slewing mobile crane in accordance with manufacturer requirements and workplace procedures
- stabilising a non-slewing mobile crane for operation by ensuring level and articulation (if required) is checked and within deration load chart requirements
- test-lifting load just clear of lifting plane to allow for checks to be safely made in consultation with associated personnel to ensure:
  - slinging is correct
  - all crane equipment is functioning properly
  - load centre of gravity is correct
  - loads of unusual shape or weight distribution are correctly slung
- test-lifting load just clear of lifting plane to allow for checks of crane computer (where fitted) to ensure:
  - load measuring equipment can be used to verify calculated weight of load
  - near capacity loads do not overload crane

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Knowledge Evidence

Evidence required to demonstrate competence in this unit must be relevant to and satisfy all of the requirements of the elements and performance criteria and include knowledge of:

- appropriate worksite communication procedures including:
  - listening
  - hand signals
  - questioning techniques
  - signage
  - two-way radios
  - written instructions
  - whistles
- crane configuration mathematical calculations to:
  - estimate loads
  - establish counterweight/s requirements (where fitted)
  - radius requirements
  - relevant lifting gear to perform work/task
- characteristics and impact of factors affecting non-slewing mobile crane stability whilst mobiling loads including:
  - side slope derations
  - articulation derations of crane
  - correct tyre pressure (inflation/condition)
  - driving safely on roadways
  - pick up and carry the load
- crane and lifting gear load chart/s and manufacturer requirements
- lift impacting factors including:
  - centre of gravity
  - dynamic nature of load
  - deflection of boom
  - length
  - radius of lift
  - weight
  - side slope derations
  - articulation derations of crane
  - tyre inflation pressures
- hazards including:
  - pack up and crane stability, crane tipping and demolition sites
  - ground stability including ground condition, recently filled trenches and slopes
  - insufficient lighting
  - obstacles or obstruction

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  - catching load swing appropriately
  - other specific hazards and dangerous materials
  - overhead hazards including:
    - electric lines
    - service pipes
    - fixed structures
    - Vegetation (Trees)
  - traffic including pedestrians, vehicles and other plant
  - operations on unusual, uneven or difficult terrains
- impact of factors affecting non-slewing mobile crane stability including:
  - overloading
  - pick up and placement of load
  - unbalanced loads
  - articulation of crane
  - correct tyre pressures (inflation/condition)
  - side slope derations
- manufacturer requirements and instructions on shutting down and packing up crane
- mobile non-slewing crane characteristics and capabilities to allow crane configuration to suit a range of loads
- relevant workplace instructions, safety information, emergency procedures
- relevant documentation requirements and procedures for recording, reporting and maintaining workplace records and information
- risk assessment management and mitigation strategies including hierarchy of control:
  - elimination
  - substitution
  - isolation
  - engineering controls
  - administrative controls
  - personal protective equipment (PPE)
- roles and responsibilities of duty holders as per legislative obligations of Work Health and Safety (WHS)/Occupational health and Safety (OHS)/Occupational Safety and Health (OSH) requirements and safe work/workplace procedures
- prestart and operational checks required for a non-slewing mobile crane
- starting procedure of crane as per manufacturer requirements
- set up of:
  - jib
  - fly jib (where fitted)
  - manual boom section (where fitted)
- weather bureau forecasts and environmental conditions that could impact operation
- workplace standards, requirements, policies and procedures for conducting operations for the mobile non-slewing crane

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- problems and applying appropriate response procedures to unplanned and/or unsafe situations and environmental conditions
- work area suitability based on relevant ground reports including:
  - backfilled ground
  - bitumen
  - concrete
  - hard compacted soil
  - pre-contaminated soils
  - rock
  - rough uneven ground
  - soft soils

Assessment Conditions

As a minimum, assessors must satisfy applicable regulatory requirements, which include requirements in the Standards for Registered Training Organisations current at the time of assessment.

As a minimum, assessment must satisfy applicable regulatory requirements, which include requirements in the Standards for Registered Training Organisations current at the time of assessment.

Assessment processes and techniques must be appropriate to the language, literacy and numeracy requirements of the work being performed and the needs of the candidate.

Assessment must occur in workplace operational situations. Where this is not appropriate, assessment must occur in simulated workplace operational situations that reflect workplace conditions.

- Simulators must not be used in the assessment of this unit of competency.

Resources for assessment must include access to:

- non-slewing articulated mobile crane with an MRC greater than 12 tonnes in safe/serviceable working order in accordance with manufacturer specifications
- appropriate loads as outlined in the performance evidence requirements
- associated personnel to sling and direct loads including:
  - dogger or rigger
- communications equipment including:
  - two-way radios
  - whistles
- personal protective equipment (PPE)
- relevant documentation for operating a non-slewing mobile crane over 3 tonnes including:
  - approved codes of practice and guidance
  - Australian Standards
  - checklists

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- industry operating procedures
- relevant industry standards (where applicable)
- logbook
- manufacturer guidelines (instructions, specifications or checklists)

Links

Companion Volume Implementation Guide - https://vetnet.gov.au/Pages/TrainingDocs.aspx?q=df441c6e-213d-43e3-874c-0b3f7036d851

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UEENEEC001B Maintain documentation

Modification History

Not Applicable

Unit Descriptor

Unit Descriptor **1) Scope:**

1.1) Descriptor

This unit covers the maintenance of the variety of documentation required to record work activities, purchases and expenses and compliance obligations. It encompasses documentation typically required in an electrotechnology enterprise, work instructions and procedures and time management.

Application of the Unit

Application of the Unit **2)**

This unit is intended for competency development entry-level employment-based programs incorporated in approved contracts of training.

Licensing/Regulatory Information

License to practice **3)**

The skills and knowledge described in this unit do not require a licence to practise in the workplace. However, practice in this unit is subject to regulations directly related to occupational health and safety and where applicable contracts of training such as apprenticeships.

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Pre-Requisites

Prerequisite Unit(s) **4)**

Competencies **4.1)**

There are no prerequisite competencies for this unit.

Literacy and numeracy skills **4.2)**

Participants are best equipped to achieve competency in this unit if they have reading, writing and numeracy skills indicated by the following scales. Description of each scale is given in Volume 2, Part 3 'Literacy and Numeracy'

Reading 3 Writing 3 Numeracy 3

Employability Skills Information

Employability Skills **5)**

The required outcomes described in this unit of competency contain applicable facets of Employability Skills. The Employability Skills Summary of the qualification in which this unit of competency is packaged will assist in identifying Employability Skill requirements.

Elements and Performance Criteria Pre-Content

6) Elements describe the essential outcomes of a unit of competency	Performance criteria describe the required performance needed to demonstrate achievement of the Element. Assessment of performance is to be consistent with the evidence guide.

Elements and Performance Criteria

ELEMENT	PERFORMANCE CRITERIA

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ELEMENT	PERFORMANCE CRITERIA
1 Prepare to maintain documentation	1.1 Documentation requirements and methods for the organisation/enterprise are identified, obtained and understood
	1.2 Advice is sought from the work supervisor, when necessary, to ensure the work is correctly documented and coordinate d effectively with others
	1.3 Forms required to document work are obtained in accordance with established routines and procedures
	1.4 OHS risk assessment and control measures are documented before work is commenced in accordance with established routine/procedures.
2 Maintain documentation.	2.1 Activities are documented promptly and at the appropriate time in accordance with established routine/procedures
	2.2 Documentation is checked for accuracy and clarity and any anomalies corrected
	2.3 Where applicable, signature is obtained from an appropriate person and the person's identification documented
	2.4 Where applicable, a copy of any required documentation is forwarded to an appropriate person in accordance with established routine/procedures
	2.5 Procedures for referring non-routine events to immediate supervisor for directions are followed

Required Skills and Knowledge

REQUIRED SKILLS AND KNOWLEDGE

8) This describes the essential skills and knowledge and their level, required for this unit.

Evidence must show that knowledge has been acquired of safe working practices and

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REQUIRED SKILLS AND KNOWLEDGE

maintaining documentation.

All knowledge and skills detailed in this unit should be contextualised to current industry practices and technologies.

KS01-EC001B Maintaining documentation

Evidence shall show an understanding of maintaining documentation to an extent indicated by the following aspects:

T1. Enterprise communication methods encompassing:

- Communicating with personnel encompassing:
  - Oral communications
  - Written procedures and work instructions
- Communicating with suppliers
- Communicating with customers

T2. Work activities records encompassing:

- Purpose and extent of maintaining work activities records in an enterprise
- Types of records for maintaining work activities in an enterprise
- Methods for recording and maintaining work records
- Work records required by regulation requirements

T3. Using basic computers and applications encompassing:

- Starting up
- Selecting application
- Entering information
- Saving
- Printing

Evidence Guide

EVIDENCE GUIDE

9) This provides essential advice for assessment of the unit. It must be read in conjunction with the performance criteria and the range statement of the unit and the Training Package Assessment Guidelines.

The Evidence Guide forms an integral part of this unit. It must be used in conjunction with all parts of this unit and performed in accordance with the Assessment Guidelines of this Training Package.

Overview of Assessment	**9.1)** Longitudinal competency development approaches to

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EVIDENCE GUIDE

assessment, such as Profiling, require data to be reliably gathered in a form that can be consistently interpreted over time. This approach is best utilised in Apprenticeship programs and reduces assessment intervention. It is the industry-preferred model for apprenticeships. However, where summative (or final) assessment is used it is to include the application of the competency in the normal work environment or, at a minimum, the application of the competency in a realistically simulated work environment. It is recognised that, in some circumstances, assessment in part or full can occur outside the workplace. However, it must be in accordance with industry and regulatory policy.

Methods chosen for a particular assessment will be influenced by various factors. These include the extent of the assessment, the most effective locations for the assessment activities to take place, access to physical resources, additional safety measures that may be required and the critical nature of the competencies being assessed.

The critical safety nature of working with electricity, electrical equipment, gas or any other hazardous substance/material carries risk in deeming a person competent. Sources of evidence need to be 'rich' in nature to minimise error in judgment.

Activities associated with normal everyday work have a bearing on the decision as to how much and how detailed the data gathered will contribute to its 'richness'. Some skills are more critical to safety and operational requirements while the same skills may be more or less frequently practised. These points are raised for the assessors to consider when choosing an assessment method and developing assessment instruments. Sample assessment instruments are included for Assessors in the Assessment Guidelines of this Training Package.

Critical aspects of evidence required to demonstrate competency in this unit

9.2)

Before the critical aspects of evidence are considered all prerequisites must be met.

Evidence for competence in this unit shall be considered holistically. Each Element and associated performance criteria shall be demonstrated on at least two occasions in accordance with the 'Assessment Guidelines - UEE07'. Evidence shall also comprise:

- A representative body of work performance demonstrated within the timeframes typically expected of the discipline, work function and industrial environment. In particular this

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EVIDENCE GUIDE

shall incorporate evidence that shows a candidate is able to:

- Implement Occupational Health and Safety workplace procedures and practices, including the use of risk control measures as specified in the performance criteria and range statement
- Apply sustainable energy principles and practices as specified in the performance criteria and range statement
- Demonstrate an understanding of the essential knowledge and associated skills as described in this unit. It may be required by some jurisdictions that RTOs provide a percentile graded result for the purpose of regulatory or licensing requirements.
- Demonstrate an appropriate level of skills enabling employment
- Conduct work observing the relevant Anti Discrimination legislation, regulations, polices and workplace procedures

- Demonstrated consistent performance across a representative range of contexts from the prescribed items below:
  - Maintain documentation in any electrotechnology enterprise information system, including:

    A Following enterprise documentation requirements.

    B Enabling documentation to communicate clearly to others.

    C Dealing with unplanned events by drawing on essential knowledge and skills to provide appropriate solutions incorporated in a holistic assessment with the above listed items.

Context of and specific resources for assessment

9.3)

This unit should be assessed as it relates to normal work practice using procedures, information and resources typical of a workplace. This should include:

- OHS policy and work procedures and instructions.
- Suitable work environment, facilities, equipment and materials to undertake actual work as prescribed in this unit.

These should be used in the formal learning/assessment environment.

Note:

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Where simulation is considered a suitable strategy for assessment it must ensure that the conditions for assessment are authentic and as far as possible reproduce and replicate the workplace and is consistent with the approved industry simulation policy.

The resources used for assessment should reflect current industry practices in relation to maintaining documentation.

Method of assessment

9.4)

This unit shall be assessed by methods given in Volume 1, Part 3 'Assessment Guidelines'.

Note:
Competent performance with inherent safe working practices is expected in the Industry to which this unit applies. This requires that the specified essential knowledge and associated skills are assessed in a structured environment which is primarily intended for learning/assessment and incorporates all necessary equipment and facilities for learners to develop and demonstrate the essential knowledge and skills described in this unit.

Concurrent assessment and relationship with other units

9.5)

For optimisation of training and assessment effort, competence in this unit may be assessed concurrently with any unit or units that require formal documentation.

Range Statement

RANGE STATEMENT

10) This relates to the unit as a whole providing the range of contexts and conditions to which the performance criteria apply. It allows for different work environments and situations that will affect performance.

This unit must be demonstrated by maintaining documentation in any electrotechnology enterprise information system.

Generic terms used throughout this Vocational Standard shall be regarded as part of the Range Statement in which competency is demonstrated. The definition of these and other terms that apply are given in Volume 2, Part 2.1.

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Unit Sector(s)

Not Applicable

Competency Field

Competency Field **11)**

Commercial

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UEENEEC002B Source and purchase material/parts for installation or service jobs

Modification History

Not Applicable

Unit Descriptor

Unit Descriptor **1) Scope:**

1.1) Descriptor

This unit covers sourcing and purchasing/ordering materials/parts for installation or service jobs. It encompasses following job specification, using manufacturer's catalogues, making telephone, internet or email enquiries, selecting compliance materials and completing the necessary purchasing documentation.

Note: In the unit the value of materials for installation jobs is limited to $20k.

Application of the Unit

Application of the Unit **2)**

This unit is intended for competency development entry-level employment-based programs incorporated in approved contracts of training. It applies to any formal recognition for this standard at the aligned AQF 3 level or higher.

Licensing/Regulatory Information

License to practice **3)**

The skills and knowledge described in this unit do not require a licence to practise in the workplace. However, practice in this unit is subject to regulations directly

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License to practice **3)**

related to occupational health and safety and where applicable contracts of training such as apprenticeships.

Pre-Requisites

Prerequisite Unit(s) **4)**

Competencies **4.1)**

There are no prerequisite competencies for this unit.

Literacy and numeracy skills **4.2)**

Participants are best equipped to achieve competency in this unit if they have reading, writing and numeracy skills indicated by the following scales. Description of each scale is given in Volume 2, Part 3 'Literacy and Numeracy'

Reading 4 Writing 4 Numeracy 4

Employability Skills Information

Employability Skills **5)**

The required outcomes described in this unit of competency contain applicable facets of Employability Skills. The Employability Skills Summary of the qualification in which this unit of competency is packaged will assist in identifying Employability Skill requirements.

Elements and Performance Criteria Pre-Content

6) Elements describe the essential outcomes of a unit of competency

Performance criteria describe the required performance needed to demonstrate achievement of the Element. Assessment of performance is to be consistent with the

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evidence guide.

Elements and Performance Criteria

ELEMENT	PERFORMANCE CRITERIA
1 Establish the extent of the materials to be purchased.	1.1 OHS procedures for a given work area are identified, obtained and understood
	1.2 Established OHS risk control measures and procedures are followed
	1.3 The extent of installation or service work is determined from job specifications, drawings or results of service calls
	1.4 Materials required for the work are determined from job specifications or requirements resulting from service calls
	1.5 Materials or parts required are documented in accordance with established routine procedures
2 Source and purchase materials.	2.1 Sources of materials are obtained based on availability and price using catalogues, computers and/or telephone in accordance with established routine procedures
	2.2 Approval to purchase alternative materials/parts is sought from an appropriately qualified and authorised person
	2.3 Price for the supply of materials/parts, particularly non-standard high cost items, is sought in accordance with routine established procedures
	2.4 Approval to purchase materials or parts is obtained in writing from the customer or other authorised person in accordance with established routine procedures
	2.5 Purchases are initiated based on price and availability of materials/parts within the required timeframe and in accordance with established routine procedures

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ELEMENT	PERFORMANCE CRITERIA
3 Document material purchases.	3.1 Material or part purchases are allocated against the appropriate jobs
	3.2 Material or part purchases are documented in accordance with established routine procedures. Note: Prices to include discounts, GST and delivery costs

Required Skills and Knowledge

REQUIRED SKILLS AND KNOWLEDGE

8) This describes the essential skills and knowledge and their level, required for this unit.

Evidence must show that knowledge has been acquired of safe working practices and the sourcing and purchasing of material/parts for installation or service jobs.

All knowledge and skills detailed in this unit should be contextualised to current industry practices and technologies.

KS01-EC002B Material Acquisition

Evidence shall show an understanding of material acquisition to an extent indicated by the following aspects:

T1. Enterprise communication methods encompassing:

- Communicating with personnel encompassing:
  - Oral communications
  - Written procedures and work instructions
- Communicating with suppliers
- Communicating with customers

T2. Work activities records encompassing:

- Purpose and extent of maintaining work activities records in an enterprise
- Types of records for maintaining work activities in an enterprise
- Methods for recording and maintaining work records
- Work records required by regulation requirements

T3. Enterprise purchasing system encompassing:

- Purchasing process

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REQUIRED SKILLS AND KNOWLEDGE

- Common suppliers
- Authorities to purchase

T4. Using basic computers and applications encompassing:

- Starting up
- Selecting application
- Entering information
- Saving
- Printing

Evidence Guide

EVIDENCE GUIDE

9) This provides essential advice for assessment of the unit. It must be read in conjunction with the performance criteria and the range statement of the unit and the Training Package Assessment Guidelines.

The Evidence Guide forms an integral part of this unit. It must be used in conjunction with all parts of this unit and performed in accordance with the Assessment Guidelines of this Training Package.

Overview of Assessment

9.1)

Longitudinal competency development approaches to assessment, such as Profiling, require data to be reliably gathered in a form that can be consistently interpreted over time. This approach is best utilised in Apprenticeship programs and reduces assessment intervention. It is the industry-preferred model for apprenticeships. However, where summative (or final) assessment is used it is to include the application of the competency in the normal work environment or, at a minimum, the application of the competency in a realistically simulated work environment. It is recognised that, in some circumstances, assessment in part or full can occur outside the workplace. However, it must be in accordance with industry and regulatory policy.

Methods chosen for a particular assessment will be influenced by various factors. These include the extent of the assessment, the most effective locations for the assessment activities to take place, access to physical resources, additional safety measures that may be required and the critical nature of the competencies being assessed.

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The critical safety nature of working with electricity, electrical equipment, gas or any other hazardous substance/material carries risk in deeming a person competent. Sources of evidence need to be 'rich' in nature to minimise error in judgment.

Activities associated with normal everyday work have a bearing on the decision as to how much and how detailed the data gathered will contribute to its 'richness'. Some skills are more critical to safety and operational requirements while the same skills may be more or less frequently practised. These points are raised for the assessors to consider when choosing an assessment method and developing assessment instruments. Sample assessment instruments are included for Assessors in the Assessment Guidelines of this Training Package.

Critical aspects of evidence required to demonstrate competency in this unit

9.2)

Before the critical aspects of evidence are considered all prerequisites must be met.

Evidence for competence in this unit shall be considered holistically. Each Element and associated performance criteria shall be demonstrated on at least two occasions in accordance with the 'Assessment Guidelines - UEE07'. Evidence shall also comprise:

- A representative body of work performance demonstrated within the timeframes typically expected of the discipline, work function and industrial environment. In particular this shall incorporate evidence that shows a candidate is able to:
  - Implement Occupational Health and Safety workplace procedures and practices, including the use of risk control measures as specified in the performance criteria and range statement
  - Apply sustainable energy principles and practices as specified in the performance criteria and range statement
  - Demonstrate an understanding of the essential knowledge and associated skills as described in this unit. It may be required by some jurisdictions that RTOs provide a percentile graded result for the purpose of regulatory or licensing requirements.
  - Demonstrate an appropriate level of skills enabling employment
  - Conduct work observing the relevant Anti Discrimination legislation, regulations, polices and workplace procedures

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- Demonstrated consistent performance across a representative range of contexts from the prescribed items below:
  - Source and purchase material/parts for installation or service jobs as described in 8) including:
    - A Establishing the extent of work on which purchases are to be based.
    - B Determining the material or parts required accurately.
    - C Using at least two methods to source materials.
    - D Obtaining quotations for supply of materials/parts.
    - E Obtaining approval to purchase.
    - F Establishing availability and arranging supply within the required timeframe.
    - G Documenting material/part purchases accurately.
    - H Dealing with unplanned events by drawing on essential knowledge and skills to provide appropriate solutions incorporated in a holistic assessment with the above listed items.

Context of and specific resources for assessment

9.3)

This unit should be assessed as it relates to normal work practice using procedures, information and resources typical of a workplace. This should include:

- OHS policy and work procedures and instructions.
- Suitable work environment, facilities, equipment and materials to undertake actual work as prescribed in this unit.

These should be used in the formal learning/assessment environment.

Note:

Where simulation is considered a suitable strategy for assessment it must ensure that the conditions for assessment are authentic and as far as possible reproduce and replicate the workplace and is consistent with the approved industry simulation policy.

The resources used for assessment should reflect current

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	industry practices in relation to sourcing and purchasing of material/parts for installation or service jobs.
Method of assessment	**9.4)** This unit shall be assessed by methods given in Volume 1, Part 3 'Assessment Guidelines'. Note: Competent performance with inherent safe working practices is expected in the Industry to which this unit applies. This requires that the specified essential knowledge and associated skills are assessed in a structured environment which is primarily intended for learning/assessment and incorporates all necessary equipment and facilities for learners to develop and demonstrate the essential knowledge and skills described in this unit.
Concurrent assessment and relationship with other units	**9.5)** Granting competency in this unit shall be made only after competency in the following unit(s) has/have been confirmed: UEENEED001B Use basic computer applications

Range Statement

RANGE STATEMENT

10) This relates to the unit as a whole providing the range of contexts and conditions to which the performance criteria apply. It allows for different work environments and situations that will affect performance.

This unit must be demonstrated in relation to sourcing and purchasing materials/parts for at least two installation jobs, two service job or one installation and one service job and may apply to any of the following electrotechnology disciplines.

- Automation technologies
- Computers
- Data Communications
- Electrical
- Electrical Machines
- Electronics
- Fire Protection

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RANGE STATEMENT

- Instrumentation
- Refrigeration and Air Conditioning
- Renewable/sustainable energy, and
- Security technology

Generic terms used throughout this Vocational Standard shall be regarded as part of the Range Statement in which competency is demonstrated. The definition of these and other terms that apply are given in Volume 2, Part 2.1.

Unit Sector(s)

Not Applicable

Competency Field

Competency Field **11)**

Commercial

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UEENEEC005B Estimate electrotechnology projects

Modification History

Not Applicable

Unit Descriptor

Unit Descriptor **1) Scope:**

1.1) Descriptor

This unit covers estimate material and labour costs for competitive quotation/tenders for work exceeding $20k. It encompasses reading and understanding job specifications, material take-offs, determining labour and site requirements, costing and documenting.

Application of the Unit

Application of the Unit **2)**

This unit is suitable for competency development employment-based programs incorporated in approved contracts of training. It applies to any formal recognition for this standard at the aligned AQF 5 level or higher.

Licensing/Regulatory Information

License to practice **3)**

The skills and knowledge described in this unit do not require a licence to practise in the workplace. However, practice in this unit is subject to regulations directly related to occupational health and safety and where applicable contracts of training such as apprenticeships.

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Pre-Requisites

Prerequisite Unit(s) **4)**

Competencies **4.1)**

There are no prerequisite competencies for this unit.

Literacy and numeracy skills **4.2)**

Participants are best equipped to achieve competency in this unit if they have reading, writing and numeracy skills indicated by the following scales. Description of each scale is given in Volume 2, Part 3 'Literacy and Numeracy'

Reading 5 Writing 5 Numeracy 5

Employability Skills Information

Employability Skills **5)**

The required outcomes described in this unit of competency contain applicable facets of Employability Skills. The Employability Skills Summary of the qualification in which this unit of competency is packaged will assist in identifying Employability Skill requirements.

Elements and Performance Criteria Pre-Content

6) Elements describe the essential outcomes of a unit of competency

Performance criteria describe the required performance needed to demonstrate achievement of the Element. Assessment of performance is to be consistent with the evidence guide.

Elements and Performance Criteria

ELEMENT	PERFORMANCE CRITERIA
1 Ascertain the extent	1.1 OHS procedures for a given work area are

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ELEMENT	PERFORMANCE CRITERIA	
of the project.		identified, obtained and understood.
	1.2	Established OHS risk control measures and procedures are followed.
	1.3	The extent of the project is established from design brief, specification and/or other relevant documentation and from discussions with appropriate person(s).
	1.4	A date by which the estimate is to be completed is determined from design brief, specification and/or other relevant documentation and from discussions with appropriate person(s).
	1.5	Activities are planned to meet scheduled timeframe in consultation with others involved in the work.
2 Estimate project.	2.1	Material take-offs are performed accurately and checked against job specifications.
	2.2	Materials, labour and other costs are determined from industry standard labour rates, enterprise costing arrangements and /or material suppliers.
	2.3	Sources and availability of materials and human resources needed for the project are established in accordance with organisation policies and procedures.
	2.4	Estimates are checked and revised where necessary, for accuracy in costing and against job specification, in consultation with appropriate person(s).
	2.5	Solutions to unplanned events are implemented consistent with enterprise policy.
3 Document and submit quotation.	3.1	Project estimates are documented in accordance with established policies and procedures.
	3.2	Quotation is forwarded to appropriate person(s) for inclusion in a submission within the specified timeframe.
	3.3	Quotation documentation is filed in accordance

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ELEMENT **PERFORMANCE CRITERIA**

with established policies and procedures.

Required Skills and Knowledge

REQUIRED SKILLS AND KNOWLEDGE

8) This describes the essential skills and knowledge and their level, required for this unit.

Evidence must show that knowledge has been acquired of safe working practices and estimating electrotechnology projects.

All knowledge and skills detailed in this unit should be contextualised to current industry practices and technologies.

KS01-EC005B **Electrotechnology projects estimation**

Evidence shall show an understanding of estimating electrotechnology projects to an extent indicated by the following aspects:

T1. Estimating electrotechnology projects encompassing:

- Documents used in estimating
- Resources to be quantified and costed
- Material take-off methods
- Costing:
  - resource (labour, plant, equipment and materials)
  - contingency
  - money
  - margins
- Labour rates method of costing
- Life cycle costing analysis
- Documenting estimations and costing.
- Evaluating estimates and costs

Evidence Guide

EVIDENCE GUIDE

9) This provides essential advice for assessment of the unit. It must be read in conjunction with the performance criteria and the range statement of the unit and the

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EVIDENCE GUIDE

Training Package Assessment Guidelines.

The Evidence Guide forms an integral part of this unit. It must be used in conjunction with all parts of this unit and performed in accordance with the Assessment Guidelines of this Training Package.

Overview of Assessment

9.1)

Longitudinal competency development approaches to assessment, such as Profiling, require data to be reliably gathered in a form that can be consistently interpreted over time. This approach is best utilised in Apprenticeship programs and reduces assessment intervention. It is the industry-preferred model for apprenticeships. However, where summative (or final) assessment is used it is to include the application of the competency in the normal work environment or, at a minimum, the application of the competency in a realistically simulated work environment. It is recognised that, in some circumstances, assessment in part or full can occur outside the workplace. However, it must be in accordance with industry and regulatory policy.

Methods chosen for a particular assessment will be influenced by various factors. These include the extent of the assessment, the most effective locations for the assessment activities to take place, access to physical resources, additional safety measures that may be required and the critical nature of the competencies being assessed.

The critical safety nature of working with electricity, electrical equipment, gas or any other hazardous substance/material carries risk in deeming a person competent. Sources of evidence need to be 'rich' in nature to minimise error in judgment.

Activities associated with normal everyday work have a bearing on the decision as to how much and how detailed the data gathered will contribute to its 'richness'. Some skills are more critical to safety and operational requirements while the same skills may be more or less frequently practised. These points are raised for the assessors to consider when choosing an assessment method and developing assessment instruments. Sample assessment instruments are included for Assessors in the Assessment Guidelines of this Training Package.

Critical aspects of evidence required to demonstrate competency in this unit

9.2)

Before the critical aspects of evidence are considered all prerequisites must be met.

Evidence for competence in this unit shall be considered

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holistically. Each Element and associated performance criteria shall be demonstrated on at least two occasions in accordance with the 'Assessment Guidelines - UEE07'. Evidence shall also comprise:

- A representative body of work performance demonstrated within the timeframes typically expected of the discipline, work function and industrial environment. In particular this shall incorporate evidence that shows a candidate is able to:
  - Implement Occupational Health and Safety workplace procedures and practices, including the use of risk control measures as specified in the performance criteria and range statement
  - Apply sustainable energy principles and practices as specified in the performance criteria and range statement
  - Demonstrate an understanding of the essential knowledge and associated skills as described in this unit. It may be required by some jurisdictions that RTOs provide a percentile graded result for the purpose of regulatory or licensing requirements.
  - Demonstrate an appropriate level of skills enabling employment
  - Conduct work observing the relevant Anti Discrimination legislation, regulations, polices and workplace procedures
- Demonstrated consistent performance across a representative range of contexts from the prescribed items below:
  - Estimate electrotechnology projects as described in 8) including:

    A Ascertaining the extent of the project accurately.

    B Planning estimation work effectively.

    C Estimating the job competitively.

    D Checking the estimates accurately.

    E Documenting the estimates clearly.

    F Dealing with unplanned events by drawing on essential knowledge and skills to provide appropriate solutions incorporated in a holistic assessment with the above listed items

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Context of and specific resources for assessment

9.3)

This unit should be assessed as it relates to normal work practice using procedures, information and resources typical of a workplace. This should include:

- OHS policy and work procedures and instructions.
- Suitable work environment, facilities, equipment and materials to undertake actual work as prescribed in this unit.

These should be used in the formal learning/assessment environment.

Note:

Where simulation is considered a suitable strategy for assessment it must ensure that the conditions for assessment are authentic and as far as possible reproduce and replicate the workplace and is consistent with the approved industry simulation policy.

The resources used for assessment should reflect current industry practices in relation to estimating electrotechnology projects.

Method of assessment

9.4)

This unit shall be assessed by methods given in Volume 1, Part 3 'Assessment Guidelines'.

Note:
Competent performance with inherent safe working practices is expected in the Industry to which this unit applies. This requires that the specified essential knowledge and associated skills are assessed in a structured environment which is primarily intended for learning/assessment and incorporates all necessary equipment and facilities for learners to develop and demonstrate the essential knowledge and skills described in this unit.

Concurrent assessment and relationship with other units

9.5)

Granting competency in this unit shall be made only after competency in the following unit(s) has/have been confirmed:

UEENEED001B	Use basic computer applications relevant to a workplace

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Range Statement

RANGE STATEMENT

10) This relates to the unit as a whole providing the range of contexts and conditions to which the performance criteria apply. It allows for different work environments and situations that will affect performance.

This unit must be demonstrated in relation to estimating at least two electrotechnology projects for a competitive quotation/tender. The value of the jobs shall exceeding $20k and may apply to any of the following electrotechnology disciplines.

- Automation technologies ·
- Computers
- Data Communications
- Electrical
- Electrical Machines
- Electronics
- Fire Protection
- Instrumentation
- Refrigeration and Air Conditioning
- Renewable/sustainable energy, and
- Security technology

Generic terms used throughout this Vocational Standard shall be regarded as part of the Range Statement in which competency is demonstrated. The definition of these and other terms that apply are given in Volume 2, Part 2.1.

Unit Sector(s)

Not Applicable

Competency Field

Competency Field **11)**

Commercial

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UEENEEC008B Receive and store materials and equipment for electrotechnology work

Modification History

Not Applicable

Unit Descriptor

Unit Descriptor **1) Scope:**

1.1) Descriptor

This unit covers the receiving and storing of materials and equipment for a construction site or workshop store. It encompasses receiving materials and equipment, checking consignment notes, storing materials and equipment and completing the necessary documentation.

Application of the Unit

Application of the Unit **2)**

This unit is intended for competency development entry-level employment-based programs incorporated in approved contracts of training.

Licensing/Regulatory Information

License to practice **3)**

The skills and knowledge described in this unit do not require a licence to practise in the workplace. However, practice in this unit is subject to regulations directly related to occupational health and safety and where applicable contracts of training such as apprenticeships.

Note:

1. Compliance with permits may be required in various jurisdictions and typically relates to the operation of

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plant, machinery and equipment such as elevating work platforms, powder operated fixing tools, and power operated tools, vehicles, road signage and traffic control, lifting equipment. Permits may also be required for some work environments such as confined spaces, working aloft, near live electrical apparatus and site rehabilitation.

2. Compliance may be required in various jurisdictions relating to currency in First Aid, confined space, lifting and risk safety measures.

Pre-Requisites

Prerequisite Unit(s) **4)**

Competencies **4.1)**

There are no prerequisite competencies for this unit.

Literacy and numeracy skills **4.2)**

Participants are best equipped to achieve competency in this unit if they have reading, writing and numeracy skills indicated by the following scales. Description of each scale is given in Volume 2, Part 3 'Literacy and Numeracy'

Reading 3 Writing 3 Numeracy 3

Employability Skills Information

Employability Skills **5)**

The required outcomes described in this unit of competency contain applicable facets of Employability Skills. The Employability Skills Summary of the qualification in which this unit of competency is packaged will assist in identifying Employability Skill requirements.

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Elements and Performance Criteria Pre-Content

6) Elements describe the essential outcomes of a unit of competency	Performance criteria describe the required performance needed to demonstrate achievement of the Element. Assessment of performance is to be consistent with the evidence guide.

Elements and Performance Criteria

ELEMENT		PERFORMANCE CRITERIA	
1	Receive materials and equipment.	1.1	OHS procedures for a given work area are identified, obtained and understood.
		1.2	OHS risk control work measures and procedures are followed.
		1.3	Documentation on pending material and equipment deliveries is read, and content and time of the delivery is understood.
		1.4	Deliveries are checked against consignment documentation before they are received.
		1.5	Discrepancies in deliveries are notified to work supervisor and supplier in accordance with established routines.
		1.6	Materials and equipment are handled in strict accordance with OHS risk control work preparation measures and procedures.
2	Store materials and equipment.	2.1	OHS risk control work measures and procedures are followed.
		2.2	Material and equipment are stored to prevent damage or loss in accordance with established routines.
		2.3	Security of the stored materials and equipment is maintained in accordance with established routines.
		2.4	Material and equipment documentation is forwarded to an appropriate person in accordance with established routine/procedures.

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Required Skills and Knowledge

REQUIRED SKILLS AND KNOWLEDGE

8) This describes the essential skills and knowledge and their level, required for this unit.

Evidence must show that knowledge has been acquired of safe working practices and of receiving and storing materials and equipment.

All knowledge and skills detailed in this unit should be contextualised to current industry practices and technologies.

KS01-EC008B Electrotechnology work store materials and equipment

Evidence shall show an understanding of electrotechnology work store materials and equipment to an extent indicated by the following aspects:

T1. Enterprise communication methods encompassing:

- Communicating with personnel encompassing:
  - Oral communications
  - Written procedures and work instructions
- Communicating with suppliers
- Communicating with customers

T2. Work activities records encompassing:

- Purpose and extent of maintaining work activities records in an enterprise
- Types of records for maintaining work activities in an enterprise
- Methods for recording and maintaining work records
- Work records required by regulation requirements

T3. Stock control methods encompassing:

- Enterprise purchasing policy
- Stock data base
- Purchase and sales entry mechanisms
- Reordering methods

T4. Using basic computers and applications encompassing:

- Starting up
- Selecting application
- Entering information
- Saving
- Printing

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Evidence Guide

EVIDENCE GUIDE

9) This provides essential advice for assessment of the unit. It must be read in conjunction with the performance criteria and the range statement of the unit and the Training Package Assessment Guidelines.

The Evidence Guide forms an integral part of this unit. It must be used in conjunction with all parts of this unit and performed in accordance with the Assessment Guidelines of this Training Package.

Overview of Assessment

9.1)

Longitudinal competency development approaches to assessment, such as Profiling, require data to be reliably gathered in a form that can be consistently interpreted over time. This approach is best utilised in Apprenticeship programs and reduces assessment intervention. It is the industry-preferred model for apprenticeships. However, where summative (or final) assessment is used it is to include the application of the competency in the normal work environment or, at a minimum, the application of the competency in a realistically simulated work environment. It is recognised that, in some circumstances, assessment in part or full can occur outside the workplace. However, it must be in accordance with industry and regulatory policy.

Methods chosen for a particular assessment will be influenced by various factors. These include the extent of the assessment, the most effective locations for the assessment activities to take place, access to physical resources, additional safety measures that may be required and the critical nature of the competencies being assessed.

The critical safety nature of working with electricity, electrical equipment, gas or any other hazardous substance/material carries risk in deeming a person competent. Sources of evidence need to be 'rich' in nature to minimise error in judgment.

Activities associated with normal everyday work have a bearing on the decision as to how much and how detailed the data gathered will contribute to its 'richness'. Some skills are more critical to safety and operational requirements while the same skills may be more or less frequently practised. These points are raised for the assessors to consider when choosing an assessment method and developing assessment instruments. Sample assessment instruments are included for Assessors in

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the Assessment Guidelines of this Training Package.

Critical aspects of evidence required to demonstrate competency in this unit

9.2)

Before the critical aspects of evidence are considered all prerequisites must be met.

Evidence for competence in this unit shall be considered holistically. Each Element and associated performance criteria shall be demonstrated on at least two occasions in accordance with the 'Assessment Guidelines - UEE07'. Evidence shall also comprise:

- A representative body of work performance demonstrated within the timeframes typically expected of the discipline, work function and industrial environment. In particular this shall incorporate evidence that shows a candidate is able to:
  - Implement Occupational Health and Safety workplace procedures and practices, including the use of risk control measures as specified in the performance criteria and range statement
  - Apply sustainable energy principles and practices as specified in the performance criteria and range statement
  - Demonstrate an understanding of the essential knowledge and associated skills as described in this unit. It may be required by some jurisdictions that RTOs provide a percentile graded result for the purpose of regulatory or licensing requirements.
  - Demonstrate an appropriate level of skills enabling employment
  - Conduct work observing the relevant Anti Discrimination legislation, regulations, polices and workplace procedures
- Demonstrated consistent performance across a representative range of contexts from the prescribed items below:
  - Receive and store materials and equipment for electrotechnology work as described in 8) including:

    A Determining content and time of pending deliveries from relevant documentation.

    B Dealing with discrepancies in deliveries.

    C Storing and securing materials and equipment to prevent damage or loss.

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D Forwarding documentation appropriately.

E Dealing with unplanned events by drawing on essential knowledge and skills to provide appropriate solutions incorporated in a holistic assessment with the above listed items.

Context of and specific resources for assessment

9.3)

This unit should be assessed as it relates to normal work practice using procedures, information and resources typical of a workplace. This should include:

- OHS policy and work procedures and instructions.
- Suitable work environment, facilities, equipment and materials to undertake actual work as prescribed in this unit.

These should be used in the formal learning/assessment environment.

Note:

Where simulation is considered a suitable strategy for assessment it must ensure that the conditions for assessment are authentic and as far as possible reproduce and replicate the workplace and is consistent with the approved industry simulation policy.

The resources used for assessment should reflect current industry practices in relation to receiving and storing materials and equipment for electrotechnology work.

Method of assessment

9.4)

This unit shall be assessed by methods given in Volume 1, Part 3 'Assessment Guidelines'.

Note:
Competent performance with inherent safe working practices is expected in the Industry to which this unit applies. This requires that the specified essential knowledge and associated skills are assessed in a structured environment which is primarily intended for learning/assessment and incorporates all necessary equipment and facilities for learners to develop and demonstrate the essential knowledge and skills described in this unit.

Concurrent assessment and relationship with other units

9.5)

For optimisation of training and assessment effort, competence in this unit may be assessed concurrently with any unit or units

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that require formal documentation.

Range Statement

RANGE STATEMENT

10) This relates to the unit as a whole providing the range of contexts and conditions to which the performance criteria apply. It allows for different work environments and situations that will affect performance.

This unit must be demonstrated in relation to receiving and storing materials and equipment for a construction site or workshop store.

Generic terms used throughout this Vocational Standard shall be regarded as part of the Range Statement in which competency is demonstrated. The definition of these and other terms that apply are given in Volume 2, Part 2.1.

Unit Sector(s)

Not Applicable

Competency Field

Competency Field **11)**

Commercial

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UEENEEC010B Deliver a service to customers

Modification History

Not Applicable

Unit Descriptor

Unit Descriptor **1) Scope:**

1.1) Descriptor

This unit covers the interacting with customers to identify and meet their service needs. It encompasses following community and enterprise policies and standards, identifying customer needs, identifying and resolving problems/issues and maintaining product/service quality.

Application of the Unit

Application of the Unit **2)**

This unit is intended for competency development entry-level employment-based programs incorporated in approved contracts of training.

Licensing/Regulatory Information

License to practice **3)**

The skills and knowledge described in this unit do not require a licence to practise in the workplace. However, practice in this unit is subject to regulations directly related to occupational health and safety and where applicable contracts of training such as apprenticeships.

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Pre-Requisites

Prerequisite Unit(s) **4)**

Competencies **4.1)**

There are no prerequisite competencies for this unit.

Literacy and numeracy skills **4.2)**

Participants are best equipped to achieve competency in this unit if they have reading, writing and numeracy skills indicated by the following scales. Description of each scale is given in Volume 2, Part 3 'Literacy and Numeracy'

Reading 3 Writing 3 Numeracy 3

Employability Skills Information

Employability Skills **5)**

The required outcomes described in this unit of competency contain applicable facets of Employability Skills. The Employability Skills Summary of the qualification in which this unit of competency is packaged will assist in identifying Employability Skill requirements.

Elements and Performance Criteria Pre-Content

6) Elements describe the essential outcomes of a unit of competency

Performance criteria describe the required performance needed to demonstrate achievement of the Element. Assessment of performance is to be consistent with the evidence guide.

Elements and Performance Criteria

ELEMENT **PERFORMANCE CRITERIA**

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ELEMENT	PERFORMANCE CRITERIA
1 Interact with customers.	1.1 Communication with customers is conducted in a professional and courteous manner according to established procedures.
	1.2 Customer enquiries are responded to promptly and politely and in accordance with established procedures.
	1.3 Personal dress and presentation is maintained in line with established procedures.
	1.4 Appropriate interpersonal skills are used to facilitate accurate and relevant exchange of information.
2 Identify customer needs.	2.1 Customer needs are assessed so that priorities for service delivery can be identified in accordance with established procedures.
	2.2 Appropriate questioning and active listening are used to determine customer needs.
	2.3 Customers are provided with information about available options for meeting their needs and assisted to identify their preferred option.
	2.4 Personal limitations in addressing customer needs are identified and where appropriate assistance is sought from appropriate personnel.
3 Deliver a service to customers.	3.1 Prompt customer service is provided to meet identified needs in accordance with established procedures.
	3.2 Service provided follows OHS policies and procedures and work is appropriately sequenced in accordance with requirements.
	3.3 Service provided is coordinated effectively with others involved on the work site.
	3.4 Customer complaints are handled sensitively and courteously in accordance with established procedures.
	3.5 Opportunities to enhance the quality of service and products are identified and taken whenever

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ELEMENT	PERFORMANCE CRITERIA	
		possible.
4 Evaluate and complete service.	4.1	Own work is monitored and adjusted according to requirements for job quality, customer service and efficient resource use.
	4.2	Customer service records are inspected and verified after service is completed to ensure requirements are met.
	4.3	Appropriate personnel are notified of the completion of the repair work and details are documented in accordance with established procedures and requirements.
	4.4	Variations in the quality of service and/or products from required standards are detected and reported in accordance with established procedures.
	4.5	Additional information or follow-up action is completed in line with customer needs.

Required Skills and Knowledge

REQUIRED SKILLS AND KNOWLEDGE

8) This describes the essential skills and knowledge and their level, required for this unit.

Evidence must show that knowledge has been acquired of safe working practices and delivering a service to customers.

All knowledge and skills detailed in this unit should be contextualised to current industry practices and technologies.

KS01-EC010B Customer service

Evidence shall show an understanding of customer service to an extent indicated by the following aspects:

T1. Enterprise communication methods encompassing:

- Communicating with personnel encompassing:
  - Oral communications
  - Written procedures and work instructions

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REQUIRED SKILLS AND KNOWLEDGE

- Communicating with suppliers
- Communicating with customers

T2. Work activities records encompassing:

- Purpose and extent of maintaining work activities records in an enterprise
- Types of records for maintaining work activities in an enterprise
- Methods for recording and maintaining work records
- Work records required by regulation requirements

T3. Problem solving concepts and techniques encompassing:

- Identify problems - process and quality problems; equipment selection, availability and failure; teamwork and work allocation problems; safety and emergency situations and incident; performance gaps; profit improvement and the like.
- Mathematical Tools - average, standard deviation and the like.
- Use of analytical techniques in problem solving - brainstorming; fishbone diagrams/cause and effect diagrams; logic trees; process logic/process requirements; similarity/difference analysis; pare to analysis; force field/SWOT analysis.
- Using tools to assistance in problem solving - Procedures and work instructions; Safety data sheets; Job cards; Maintenance logs; Plant drawing.
- Determine corrective action:
  - Tools
  - Mode of communication procedure used within each enterprise
  - Established work procedures and policies
  - Size and structure of the teams/enterprise
  - Group goals - team, section, enterprise
  - Enterprise specific conflict resolution procedures
  - Action plans
  - Priority requirements
  - Measurable objectives
  - Resource requirements
  - Methods for reaching objectives
  - Timelines
  - Safety requirements
  - Risk assessment
  - Environmental requirements
- Communicate recommendations - feedback requirements; corrective action and analysis; following up recommendations and the like.
- Implement Monitoring encompassing:
  - Identifying components to be measured
  - Measurement and monitoring techniques

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REQUIRED SKILLS AND KNOWLEDGE

- Measurement and monitoring tools

T4. Enterprise customer relations protocols encompassing:

- Purpose of customer relations
- Procedures for dealing with customers
- Dealing with customer issues

T5. Enterprise quality management system encompassing:

- Purpose of a quality system
- Procedures pertaining to the relevant work function
- Work instructions pertaining to the relevant work function

T6. Instructing users in the use of specific items of equipment and systems encompassing:

- Methods for evaluating user needs - how equipment is used efficiently and safely and identifying wear and tear and damage to the equipment that requires repairing.
- Basic instruction methods - be appropriate to the culture of the users and the equipment for which instruction is given.
- Methods for evaluating user's ability use equipment correctly

Evidence Guide

EVIDENCE GUIDE

9) This provides essential advice for assessment of the unit. It must be read in conjunction with the performance criteria and the range statement of the unit and the Training Package Assessment Guidelines.

The Evidence Guide forms an integral part of this unit. It must be used in conjunction with all parts of this unit and performed in accordance with the Assessment Guidelines of this Training Package.

Overview of Assessment	**9.1)** Longitudinal competency development approaches to assessment, such as Profiling, require data to be reliably gathered in a form that can be consistently interpreted over time. This approach is best utilised in Apprenticeship programs and reduces assessment intervention. It is the industry-preferred model for apprenticeships. However, where summative (or final) assessment is used it is to include the application of the competency in the normal work environment or, at a minimum, the application of the competency in a realistically simulated work environment. It is recognised that, in some circumstances,

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EVIDENCE GUIDE

assessment in part or full can occur outside the workplace. However, it must be in accordance with industry and regulatory policy.

Methods chosen for a particular assessment will be influenced by various factors. These include the extent of the assessment, the most effective locations for the assessment activities to take place, access to physical resources, additional safety measures that may be required and the critical nature of the competencies being assessed.

The critical safety nature of working with electricity, electrical equipment, gas or any other hazardous substance/material carries risk in deeming a person competent. Sources of evidence need to be 'rich' in nature to minimise error in judgment.

Activities associated with normal everyday work have a bearing on the decision as to how much and how detailed the data gathered will contribute to its 'richness'. Some skills are more critical to safety and operational requirements while the same skills may be more or less frequently practised. These points are raised for the assessors to consider when choosing an assessment method and developing assessment instruments. Sample assessment instruments are included for Assessors in the Assessment Guidelines of this Training Package.

Critical aspects of evidence required to demonstrate competency in this unit

9.2)

Before the critical aspects of evidence are considered all prerequisites must be met.

Evidence for competence in this unit shall be considered holistically. Each Element and associated performance criteria shall be demonstrated on at least two occasions in accordance with the 'Assessment Guidelines - UEE07'. Evidence shall also comprise:

- A representative body of work performance demonstrated within the timeframes typically expected of the discipline, work function and industrial environment. In particular this shall incorporate evidence that shows a candidate is able to:
  - Implement Occupational Health and Safety workplace procedures and practices, including the use of risk control measures as specified in the performance criteria and range statement
  - Apply sustainable energy principles and practices as specified in the performance criteria and range statement
  - Demonstrate an understanding of the essential knowledge and associated skills as described in this unit.

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EVIDENCE GUIDE

It may be required by some jurisdictions that RTOs provide a percentile graded result for the purpose of regulatory or licensing requirements.

- Demonstrate an appropriate level of skills enabling employment
- Conduct work observing the relevant Anti Discrimination legislation, regulations, polices and workplace procedures

- Demonstrated consistent performance across a representative range of contexts from the prescribed items below:
  - Deliver a service to customers as described in 8) including:

    A Interacting with customers appropriately.

    B Identifying customer needs accurately.

    C Identifying and resolving customer issues promptly and amicably.

    D Delivering a service.

    E Reflecting on the completed service positively.

    F Dealing with unplanned events by drawing on essential knowledge and skills to provide appropriate solutions incorporated in a holistic assessment with the above listed items.

Context of and specific resources for assessment

9.3)

This unit should be assessed as it relates to normal work practice using procedures, information and resources typical of a workplace. This should include:

- OHS policy and work procedures and instructions.
- Suitable work environment, facilities, equipment and materials to undertake actual work as prescribed in this unit.

These should be used in the formal learning/assessment environment.

Note:

Where simulation is considered a suitable strategy for assessment it must ensure that the conditions for assessment are authentic and as far as possible reproduce and replicate the workplace and is consistent with the approved industry

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EVIDENCE GUIDE

	simulation policy. The resources used for assessment should reflect current industry practices in relation to delivering a service to customers.
Method of assessment	**9.4)** This unit shall be assessed by methods given in Volume 1, Part 3 'Assessment Guidelines'. Note: Competent performance with inherent safe working practices is expected in the Industry to which this unit applies. This requires that the specified essential knowledge and associated skills are assessed in a structured environment which is primarily intended for learning/assessment and incorporates all necessary equipment and facilities for learners to develop and demonstrate the essential knowledge and skills described in this unit.
Concurrent assessment and relationship with other units	**9.5)** For optimisation of training and assessment effort, competence in this unit may be assessed concurrently with any unit or units that require formal documentation.

Range Statement

RANGE STATEMENT

10) This relates to the unit as a whole providing the range of contexts and conditions to which the performance criteria apply. It allows for different work environments and situations that will affect performance.

This unit must be demonstrated by delivering a service to customers in any of the electrotechnology disciplines.

Generic terms used throughout this Vocational Standard shall be regarded as part of the Range Statement in which competency is demonstrated. The definition of these and other terms that apply are given in Volume 2, Part 2.1.

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Unit Sector(s)

Not Applicable

Competency Field

Competency Field **11)**

Commercial

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UEENEED101A Use computer applications relevant to a workplace

Modification History

Not applicable.

Unit Descriptor

Unit Descriptor **1) Scope:**

1.1) Descriptor

This unit covers the basic use of personal computers application relevant to a work function. It encompasses switching the computer on, applying user preferences, selecting basic applications, entering and retrieving information and printing files.

Note:

This unit applies to all aspects of Electrotechnology – engineering applications only. For general competencies related to Information Technologies refer to the latest endorsed IT Training Package.

Application of the Unit

Application of the Unit **2)**

This unit is intended for competency development entry-level employment-based programs incorporated in approved contracts of training. It may be used to augment previously acquired competencies.

Licensing/Regulatory Information

License to practice **3)**

The skills and knowledge described in this unit do not require a license to practice in the workplace. However, practice in this unit is subject to regulations directly

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License to practice **3)**

related to occupational health and safety and where applicable contracts of training such as apprenticeships.

Pre-Requisites

Prerequisite Unit(s) **4)**

Competencies **4.1)**

Granting competency in this unit shall be made only after competency in the following unit(s) has/have been confirmed.

UEENEEE101A	Apply Occupational Health Safety regulations, codes and practices in the workplace.

Literacy and numeracy skills **4.2)**

Participants are best equipped to achieve competency in this unit if they have reading, writing and numeracy skills indicated by the following scales. Description of each scale is given in Volume 2, Part 3 ‘Literacy and Numeracy’

Reading 3 Writing 3 Numeracy 3

Employability Skills Information

Employability Skills **5)**

The required outcomes described in this unit of competency contain applicable facets of Employability Skills. The Employability Skills Summary of the qualification in which this unit of competency is packaged will assist in identifying Employability Skill requirements.

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Elements and Performance Criteria Pre-Content

6) Elements describe the essential outcomes of a competency standard unit	Performance Criteria describe the required performance needed to demonstrate achievement of the element. Assessment of performance is to be consistent with the Evidence Guide.

Elements and Performance Criteria

ELEMENT	PERFORMANCE CRITERIA
1 Prepare to use computer applications.	1.1 OHS procedures for a given work area are identified, obtained and understood through established routines and procedures.
	1.2 Established OHS risk control measures and procedures in relation to computer and keyboard use are followed.
	1.3 Information required for the use of the application is obtained from appropriate sources.
	1.4 Computer is started up and desktop icons are manipulated to access desired application, directories and files.
	1.5 On-screen instructions in relation to any anomaly such as a virus warning are followed.
	1.6 Help directory is used to resolve any straightforward start up or access issues or anomalies.
2 Use computer basic application.	2.1 Established OHS risk control measures and procedures for carrying out the work are followed.
	2.2 Information is added, altered or deleted as needed in accordance with application user instructions.
	2.3 Routine checks are made to ensure accuracy of information in accordance with quality requirements.
3 Output information	3.1 Completed files are stored appropriately in

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ELEMENT	PERFORMANCE CRITERIA	
from an application.		accordance with enterprise requirements.
	3.2	Files are printed for a formal record and/or to forward to others.
	3.3	Files are sent via email in a readable format.
4 Shut down computer.	4.1	Files are named, arranged, saved and backed up in accordance with enterprise requirements.
	4.2	Computer shutdown procedures are followed and computer switched off.

Required Skills and Knowledge

REQUIRED SKILLS AND KNOWLEDGE

8) This describes the essential skills and knowledge and their level, required for this unit.

Evidence shall show that knowledge has been acquired of safe working practices using basic computer applications relevant to a workplace.

All knowledge and skills detailed in this unit should be contextualised to current industry practices and technologies.

KS01-ED101A Basic Computer Applications

Evidence shall show an understanding of computer use basics to an extent indicated by the following aspects:

T1 Starting up

T2 Selecting application

T3 Entering information

T4 Saving

T5 Printing

Evidence Guide

EVIDENCE GUIDE

9) This provides essential advice for assessment of the unit and must be read in

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EVIDENCE GUIDE

conjunction with the performance criteria and the range statement of the unit and the Training Package Assessment Guidelines.

The Evidence Guide forms an integral part of this unit. It must be used in conjunction with all parts of this unit and performed in accordance with the Assessment Guidelines of this Training Package.

Overview of Assessment **9.1)**

Longitudinal competency development approaches to assessment, such as Profiling, require data to be reliably gathered in a form that can be consistently interpreted over time. This approach is best utilised in Apprenticeship programs and reduces assessment intervention. It is the industry-preferred model for apprenticeships. However, where summative (or final) assessment is used it is to include the application of the competency in the normal work environment or, at a minimum, the application of the competency in a realistically simulated work environment. It is recognised that, in some circumstances, assessment in part or full can occur outside the workplace. However, it must be in accordance with industry and regulatory policy.

Methods chosen for a particular assessment will be influenced by various factors. These include the extent of the assessment, the most effective locations for the assessment activities to take place, access to physical resources, additional safety measures that may be required and the critical nature of the competencies being assessed.

The critical safety nature of working with electricity, electrical equipment, gas or any other hazardous substance/material carries risk in deeming a person competent. Sources of evidence need to be ‘rich’ in nature to minimise error in judgment.

Activities associated with normal everyday work have a bearing on the decision as to how much and how detailed the data gathered will contribute to its ‘richness’. Some skills are more critical to safety and operational requirements while the same skills may be more or less frequently practised. These points are raised for the assessors to consider when choosing an assessment method and developing assessment instruments. Sample assessment instruments are included for Assessors in the Assessment Guidelines of this Training Package.

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Critical aspects of evidence required to demonstrate competency in this unit **9.2)**

Before the critical aspects of evidence are considered all prerequisites shall be met.

Evidence for competence in this unit shall be considered holistically. Each element and associated performance criteria shall be demonstrated on at least two occasions in accordance with the 'Assessment Guidelines – UEE11'. Evidence shall also comprise:

- A representative body of work performance demonstrated within the timeframes typically expected of the discipline, work function and industrial environment. In particular this shall incorporate evidence that shows a candidate is able to:
  - Implement Occupational Health and Safety workplace procedures and practices, including the use of risk control measures as specified in the performance criteria and range statement
  - Apply sustainable energy principles and practices as specified in the performance criteria and range statement
  - Demonstrate an understanding of the essential knowledge and associated skills as described in this unit. It may be required by some jurisdictions that RTOs provide a percentile graded result for the purpose of regulatory or licensing requirements.
  - Demonstrate an appropriate level of skills enabling employment
  - Conduct work observing the relevant Anti Discrimination legislation, regulations, polices and workplace procedures
- Demonstrated consistent performance across a representative range of contexts from the prescribed items below:
  - Use basic computer applications relevant to workplace as described in 8) and including:

A Correctly starting-up a computer.

B Dealing with anomalies appropriately.

C Following application instructions to input and output information.

D Storing information appropriately.

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E	Outputting information to a printer.
F	Forwarding information via email and/or web mail in a readable format.
G	Producing, storing and forwarding engineering related reports and/or results using at least three computer applications according to requirements
H	Shutting down a computer correctly
I	Dealing with unplanned events by drawing on essential knowledge and skills to provide appropriate solutions incorporated in a holistic assessment with the above listed items.

Note:

Successful completion of relevant vendor training may be used to contribute to evidence on which competency is deemed. In these cases the alignment of outcomes of vendor training with performance criteria and critical aspects of evidence shall be clearly identified.

Context of and specific resources for assessment

9.3)

This unit should be assessed as it relates to normal work practice using procedures, information and resources typical of a workplace. This should include:

- OHS policy and work procedures and instructions.
- Suitable work environment, facilities, equipment and materials to undertake actual work as prescribed in this unit.

These should be used in the formal learning/assessment environment.

Note:

Where simulation is considered a suitable strategy for assessment, conditions for assessment must be authentic and as far as possible reproduce and replicate the workplace and be consistent with the approved industry simulation policy.

In addition to the resources listed above, evidence should show demonstrated competency to produce, store and forward engineering related reports and/or results using a range of

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computer applications.

Method of assessment **9.4)**

This unit shall be assessed by methods given in Volume 1, Part 3 'Assessment Guidelines'.

Note:

Competent performance with inherent safe working practices is expected in the Industry to which this unit applies. This requires assessment in a structured environment which is primarily intended for learning/assessment and incorporates all necessary equipment and facilities for learners to develop and demonstrate the essential knowledge and skills described in this unit.

Concurrent assessment and relationship with other units **9.5)**

There are no concurrent assessment recommendations for this unit.

Range Statement

RANGE STATEMENT

10) This relates to the unit as a whole providing the range of contexts and conditions to which the performance criteria apply. It allows for different work environments and situations that will affect performance.

This unit shall/may be demonstrated in relation to at least three of the following using computer applications to produce, store and forward engineering related reports and/or results at a basic level.

- Word processing
- Spread sheet
- Drawings
- Business management
- Apparatus set-up
- Note:

Apparatus set-up applications are invariably vendor specific and include

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RANGE STATEMENT

icon-based integration and control applications.

Generic terms used throughout this Vocational Standard shall be regarded as part of the Range Statement in which competency is demonstrated. The definition of these and other terms that apply are given in Volume 2, Part 2.1.

Unit Sector(s)

Not applicable.

Competency Field

Competency Field **11)**

Computer Systems

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UEENEED104A Use engineering applications software on personal computers

Modification History

Not applicable.

Unit Descriptor

Unit Descriptor **1) Scope:**

1.1) Descriptor

This unit covers the use of computer application relevant to engineering support work functions. It encompasses applying user preferences, using application menus and tools, entering and retrieve information, working with groups and transferring and printing files.

Note:

Examples of engineering application software are Visio, Electronic Work Bench, Lab View, Network Simulator.

Application of the Unit

Application of the Unit **2)**

This unit is intended for competency development entry-level employment-based programs incorporated in approved contracts of training. It may be used to augment previously acquired competencies.

Licensing/Regulatory Information

License to practice **3)**

The skills and knowledge described in this unit do not require a license to practice in the workplace. However, practice in this unit is subject to regulations directly related to occupational health and safety and where applicable contracts of training such as apprenticeships.

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Pre-Requisites

Prerequisite Unit(s) **4)**

Competencies **4.1)**

Granting competency in this unit shall be made only after competency in the following unit(s) has/have been confirmed.

UEENEEE101A	Apply Occupational Health Safety regulations, codes and practices in the workplace

Literacy and numeracy skills **4.2)**

Participants are best equipped to achieve competency in this unit if they have reading, writing and numeracy skills indicated by the following scales. Description of each scale is given in Volume 2, Part 3 'Literacy and Numeracy'

Reading	3	Writing	3	Numeracy	3

Employability Skills Information

Employability Skills **5)**

The required outcomes described in this unit of competency contain applicable facets of Employability Skills. The Employability Skills Summary of the qualification in which this unit of competency is packaged will assist in identifying Employability Skill requirements.

Elements and Performance Criteria Pre-Content

6) Elements describe the essential outcomes of a	Performance Criteria describe the required performance needed to demonstrate achievement of the element.

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competency standard unit	Assessment of performance is to be consistent with the Evidence Guide.

Elements and Performance Criteria

ELEMENT		PERFORMANCE CRITERIA	
1	Prepare to use computer applications.	1.1	OHS procedures for a given work area are identified, obtained and understood through established routines and procedures.
		1.2	Established OHS risk control measures and procedures in relation to computer and keyboard use are followed.
		1.3	Application software and information required for use is obtained from appropriate sources.
		1.4	On-screen instructions in relation to any anomaly such as a virus warning are followed.
		1.5	Help menu is used to resolve any straightforward start up or access issues or anomalies.
2	Use engineering application software.	2.1	Established OHS risk control measures and procedures for carrying out the work are followed.
		2.2	Techniques that apply to a particular software package are used to produce appropriate files.
		2.3	Routine checks are made to ensure accuracy of information in accordance with quality requirements.
3	Output information from an application.	3.1	Completed files are stored appropriately in accordance with enterprise requirements.
		3.2	Files are printed for formal records and/or forwarded to others.
4	Shut down computer.	4.1	Files are named, arranged, saved and backed up in accordance with enterprise requirements.
		4.2	Computer shutdown procedures are followed and computer switched off.

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Required Skills and Knowledge

REQUIRED SKILLS AND KNOWLEDGE

8) This describes the essential skills and knowledge and their level, required for this unit.

Evidence shall show that knowledge has been acquired of safe working practices using engineering application software.

All knowledge and skills detailed in this unit should be contextualised to current industry practices and technologies.

KS01-ED104A Personal computers, engineering applications software basic

Evidence shall show an understanding of object orientated programming basics to an extent indicated by the following aspects:

T1 Computer Systems Overview encompassing:

- Safety
- Applications of computers in industry
- Types of computer systems
- Hardware components
- Software and firmware
- Memory
- Peripherals
- Removable storage devices
- PC hardware inventory
- Networking

T2 Operating System Overview encompassing:

- Software layer model
- Function and characteristics of an operating system
- File structure
- Formatting disks
- Boot process
- Configuration files

T3 Windows Operating System encompassing

- Windows screen
- Windows Explorer
- File management
- Managing software, updates, backups and virus protection.

T4 Word Processors encompassing

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REQUIRED SKILLS AND KNOWLEDGE

- Word files
- Formatting
- Engineering symbols
- Tables and lists
- Drawings
- Spelling, grammar, and ‘search-and-replace’
- Printing

T5 Spreadsheets encompassing

- Parts of a spreadsheet
- Excel file management
- Inserting data into spreadsheets
- Formatting spreadsheets
- Charts
- Engineering problem solving
- Printing

T6 Databases encompassing:

- Features and purpose of database
- Searching existing database
- Creating a simple database
- Manipulating data in a database
- Advance sort functions
- Reports

T7 Transferring Data Between Windows Applications encompassing:

- Moving data between Word, Excel and Access

T8 Drawing and Computer Assisted Design (CAD) programs encompassing:

- Computer drawing using applications such as Visio.
- Incorporation of electrical/electronic symbols into computer drawings.

T9 E-mail and Internet Browsers encompassing:

- Browsers
- Search Engines
- Web-based e-mail (e.g. Hotmail)
- Application-based e-mail (e.g. Outlook).

Evidence Guide

EVIDENCE GUIDE

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EVIDENCE GUIDE

9) This provides essential advice for assessment of the unit and must be read in conjunction with the performance criteria and the range statement of the unit and the Training Package Assessment Guidelines.

The Evidence Guide forms an integral part of this unit. It must be used in conjunction with all parts of this unit and performed in accordance with the Assessment Guidelines of this Training Package.

Overview of Assessment **9.1)**

Longitudinal competency development approaches to assessment, such as Profiling, require data to be reliably gathered in a form that can be consistently interpreted over time. This approach is best utilised in Apprenticeship programs and reduces assessment intervention. It is the industry-preferred model for apprenticeships. However, where summative (or final) assessment is used it is to include the application of the competency in the normal work environment or, at a minimum, the application of the competency in a realistically simulated work environment. It is recognised that, in some circumstances, assessment in part or full can occur outside the workplace. However, it must be in accordance with industry and regulatory policy.

Methods chosen for a particular assessment will be influenced by various factors. These include the extent of the assessment, the most effective locations for the assessment activities to take place, access to physical resources, additional safety measures that may be required and the critical nature of the competencies being assessed.

The critical safety nature of working with electricity, electrical equipment, gas or any other hazardous substance/material carries risk in deeming a person competent. Sources of evidence need to be ‘rich’ in nature to minimise error in judgment.

Activities associated with normal everyday work have a bearing on the decision as to how much and how detailed the data gathered will contribute to its ‘richness’. Some skills are more critical to safety and operational requirements while the same skills may be more or less frequently practised. These points are raised for the assessors to consider when choosing an assessment method and developing assessment instruments. Sample assessment instruments are included for Assessors in the Assessment Guidelines of this Training Package.

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Critical aspects of evidence required to demonstrate competency in this unit

9.2)

Before the critical aspects of evidence are considered all prerequisites shall be met.

Evidence for competence in this unit shall be considered holistically. Each element and associated performance criteria shall be demonstrated on at least two occasions in accordance with the 'Assessment Guidelines – UEE11'. Evidence shall also comprise:

- A representative body of work performance demonstrated within the timeframes typically expected of the discipline, work function and industrial environment. In particular this shall incorporate evidence that shows a candidate is able to:
  - Implement Occupational Health and Safety workplace procedures and practices, including the use of risk control measures as specified in the performance criteria and range statement
  - Apply sustainable energy principles and practices as specified in the performance criteria and range statement
  - Demonstrate an understanding of the essential knowledge and associated skills as described in this unit. It may be required by some jurisdictions that RTOs provide a percentile graded result for the purpose of regulatory or licensing requirements.
  - Demonstrate an appropriate level of skills enabling employment
  - Conduct work observing the relevant Anti Discrimination legislation, regulations, polices and workplace procedures
- Demonstrated consistent performance across a representative range of contexts from the prescribed items below:
  - Use engineering applications software as described in 8) and including:

A Following application instructions to input and output information.

B Storing information appropriately.

C Outputting information to a printer.

D Transferring information between systems.

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E	Saving, storing and backing up files for effective retrieval by others.
F	Dealing with unplanned events by drawing on essential knowledge and skills to provide appropriate solutions incorporated in a holistic assessment with the above listed items.

Note:

Successful completion of relevant vendor training may be used to contribute to evidence on which competency is deemed. In these cases the alignment of outcomes of vendor training with performance criteria and critical aspects of evidence shall be clearly identified.

Context of and specific resources for assessment

9.3)

This unit should be assessed as it relates to normal work practice using procedures, information and resources typical of a workplace. This should include:

- OHS policy and work procedures and instructions.
- Suitable work environment, facilities, equipment and materials to undertake actual work as prescribed in this unit.

These should be used in the formal learning/assessment environment.

Note:

Where simulation is considered a suitable strategy for assessment, conditions for assessment must be authentic and as far as possible reproduce and replicate the workplace and be consistent with the approved industry simulation policy.

The resources used for assessment should reflect current industry practices in relation to using engineering application software.

Method of assessment

9.4)

This unit shall be assessed by methods given in Volume 1, Part 3 ‘Assessment Guidelines’.

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Note:

Competent performance with inherent safe working practices is expected in the Industry to which this unit applies. This requires assessment in a structured environment which is primarily intended for learning/assessment and incorporates all necessary equipment and facilities for learners to develop and demonstrate the essential knowledge and skills described in this unit.

Concurrent assessment and relationship with other units

9.5)

There are no concurrent assessment recommendations for this unit.

Range Statement

RANGE STATEMENT

10) This relates to the unit as a whole providing the range of contexts and conditions to which the performance criteria apply. It allows for different work environments and situations that will affect performance.

This unit shall be demonstrated in relation to using at least two of the following types of engineering applications at a basic level.

- Office Applications
- Computer Aided Design
- Engineering data analysis software
- Engineering modelling
- Project management
- Network simulator
- Protocol analyser

Generic terms used throughout this Vocational Standard shall be regarded as part of the Range Statement in which competency is demonstrated. The definition of these and other terms that apply are given in Volume 2, Part 2.1.

Unit Sector(s)

Not applicable.

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Competency Field

Competency Field **11)**

Computer Systems

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UEENEEE009B Comply with scheduled and preventative maintenance program processes

Modification History

Not Applicable

Unit Descriptor

Unit Descriptor **1) Scope:**

1.1) Descriptor

This unit covers the quality assurance and risk management compliance processes for maintenance of the electrotechnology aspects of plant and equipment. It encompasses working safely and to technical, quality and risk management standards, work specifications and maintenance schedules, sample inspections, evaluating components and completing the necessary maintenance documentation.

Application of the Unit

Application of the Unit **2)**

This unit apply to any qualification in this standard at an AQF 3 level.

Licensing/Regulatory Information

License to practice **3)**

The skills and knowledge described in this unit require a license to practice in the workplace where plant and equipment operate at voltage above 50 V a.c. or 120 V d.c. Where refrigeration and air conditioning are involved practice in the workplace is subject to Federal/State/Territory regulations covering the use of refrigerants and the relevant codes of practice; in some

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jurisdictions a licence is required.

Practice in the workplace is also subject to regulations directly related to occupational health and safe and contracts of training such as new apprenticeships.

Pre-Requisites

Prerequisite Unit(s) **4)**

Competencies **4.1)**

There are no prerequisite competencies for this unit.

Literacy and numeracy skills **4.2)**

Participants are best equipped to achieve competency in this unit if they have reading, writing and numeracy skills indicated by the following scales. Description of each scale is given in Volume 2, Part 3 'Literacy and Numeracy'

Reading 3 Writing 3 Numeracy 3

Employability Skills Information

Employability Skills **5)**

This unit contains Employability Skills

The required outcomes described in this unit of competency contain applicable facets of Employability Skills. The Employability Skills Summary of the qualification in which this unit of competency is packaged will assist in identifying Employability Skill requirements.

Elements and Performance Criteria Pre-Content

6) Elements describe the essential outcomes of a

Performance criteria describe the required performance needed to demonstrate achievement of the Element.

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unit of competency	Assessment of performance is to be consistent with the evidence guide.

Elements and Performance Criteria

ELEMENT	PERFORMANCE CRITERIA
1 Prepare to comply with scheduled maintenance program processes.	1.1 OHS procedures for a given work area are identified, obtained and understood.
	1.2 Established OHS risk control measures and procedures in preparation for the work are followed.
	1.3 Safety hazards which have not previously identified are noted and established risk control measures are implemented.
	1.4 The maintenance schedule and process compliance requirements are confirmed and work appropriately sequenced in accordance with established procedures.
	1.5 Appropriate person(s) are consulted to ensure the work is coordinated effectively with others involved on the work site.
	1.6 Location equipment to be maintained is determined from maintenance schedule procedures and/or system specifications and diagrams.
	1.7 Resources needed to conduct the maintenance is obtained in accordance with established procedures and checked against job requirements.
	1.8 Tools, equipment and testing devices needed to conduct the maintenance are obtained in accordance with established procedures and checked for correct operation and safety.
2 Comply with scheduled maintenance program processes.	2.1 OHS risk control measures and procedures for carrying out the work are followed.
	2.2 Test or measure on a live and operating system in strict accordance with OHS requirements and

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ELEMENT	PERFORMANCE CRITERIA	
		within established safety procedures.
	2.3	Circuits/machines/plant are checked as being isolated where necessary in strict accordance OHS requirements and procedures.
	2.4	Apparatus to be maintained is inspected and evaluated for compliance with requirements in accordance with maintenance schedule.
	2.5	Non-compliant apparatus/components are documented and arrangements made for their rectification in accordance with established procedures.
	2.6	Established methods for dealing with unexpected situations are discussed with appropriate person or persons and documented.
	2.7	Ongoing checks of the quality of the maintenance are undertaken in accordance with established procedures.
	2.8	Maintenance process compliance is performed efficiently without waste of materials or damage to apparatus and the surrounding environment or services and using sustainable energy practices.
3 Completion of maintenance compliance processes.	3.1	OHS work completion risk control measures and procedures are followed.
	3.2	Work site and equipment is cleaned and made safe in accordance with established procedures.
	3.3	Final checks are made to verify that the maintenance complies with requirements.
	3.4	Maintenance completion is documented and appropriate person(s) notified in accordance with established procedures.

Required Skills and Knowledge

REQUIRED SKILLS AND KNOWLEDGE

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REQUIRED SKILLS AND KNOWLEDGE

8) This describes the essential skills and knowledge and their level, required for this unit.

Evidence shall show that knowledge has been acquired of safe working practices and complying with scheduled and preventative maintenance program processes.

All knowledge and skills detailed in this unit should be contextualised to current industry practices and technologies.

KS01-EE009B Scheduled maintenance process

Evidence shall show an understanding of maintenance processors to an extent indicated by the following aspects:

- Maintenance principles encompassing:
  - maintenance function
  - role of maintenance department
  - occupational health and safety requirements
- Maintenance systems encompassing:
  - maintenance terminology
  - preventative maintenance
  - predictive maintenance
  - corrective maintenance
- Data acquisition encompassing:
  - plant history cards/files
  - inspection techniques
  - predictive maintenance
  - remote visual inspection
  - non-destructive testing
  - thermography
  - vibration analysis
  - oil analysis
- Maintenance plan encompassing:
  - characteristics of plant operation
  - assessment of failure characteristics
  - link failure characteristics to maintenance systems
  - identify production windows
  - resources
  - labour
  - materials
  - establish plan
  - implementation procedures

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REQUIRED SKILLS AND KNOWLEDGE

- Review of maintenance plan encompassing:
  - analysis of records
  - manual recording methods
- Computerised recording methods

Evidence Guide

EVIDENCE GUIDE

9) The evidence guide provides advice on assessment and must be read in conjunction with the Performance Criteria, Required Skills and Knowledge, the Range Statement and the Assessment Guidelines for this Training Package.

The Evidence Guide forms an integral part of this unit. It must be used in conjunction with all parts of the unit and performed in accordance with the Assessment Guidelines of this Training Package.

Overview of Assessment

9.1)

Longitudinal competency development approaches to assessment, such as Profiling, require data to be reliably gathered in a form that can be consistently interpreted over time. This approach is best utilised in Apprenticeship programs and reduces assessment intervention. It is the industry-preferred model for apprenticeships. However, where summative (or final) assessment is used it is to include the application of the competency in the normal work environment or, at a minimum, the application of the competency in a realistically simulated work environment. It is recognised that, in some circumstances, assessment in part or full can occur outside the workplace. However, it must be in accordance with industry and regulatory policy.

Methods chosen for a particular assessment will be influenced by various factors. These include the extent of the assessment, the most effective locations for the assessment activities to take place, access to physical resources, additional safety measures that may be required and the critical nature of the competencies being assessed.

The critical safety nature of working with electricity, electrical equipment, gas or any other hazardous substance/material carries risk in deeming a person competent. Sources of evidence need to be 'rich' in nature to minimise error in judgment.

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EVIDENCE GUIDE

Activities associated with normal everyday work have a bearing on the decision as to how much and how detailed the data gathered will contribute to its 'richness'. Some skills are more critical to safety and operational requirements while the same skills may be more or less frequently practised. These points are raised for the assessors to consider when choosing an assessment method and developing assessment instruments. Sample assessment instruments are included for Assessors in the Assessment Guidelines of this Training Package.

Critical aspects of evidence required to demonstrate competency in this unit

9.2)

Before the critical aspects of evidence are considered all prerequisites must be met.

Evidence for competence in this unit shall be considered holistically. Each element and associated performance criteria shall be demonstrated on at least two occasions in accordance with the 'Assessment Guidelines - UEE07'. Evidence shall also comprise:

- A representative body of work performance demonstrated within the timeframes typically expected of the discipline, work function and industrial environment. In particular this shall incorporate evidence that shows a candidate is able to:
  - Implement Occupational Health and Safety workplace procedures and practices, including the use of risk control measures as specified in the performance criteria and range statement
  - Apply sustainable energy principles and practices as specified in the performance criteria and range statement
  - Demonstrate an understanding of the essential knowledge and associated skills as described in this unit. It may be required by some jurisdictions that RTOs provide a percentile graded result for the purpose of regulatory or licensing requirements.
  - Demonstrate an appropriate level of skills enabling employment
  - Conduct work observing the relevant Anti Discrimination legislation, regulations, polices and workplace procedures
- Demonstrated consistent performance across a representative range of contexts from the prescribed items below:
  - Comply with scheduled and preventative maintenance program processes as described in 8) and including:

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EVIDENCE GUIDE

A Interpreting maintenance schedule requirements correctly.

B Following quality assurance and risk management compliance processes.

C Following maintenance schedule.

D Inspecting and evaluating apparatus for quality assurance and risk compliance.

E Arranging for corrective action of non compliant apparatus.

F Documenting maintenance work.

G Dealing with unplanned events by drawing on essential knowledge and skills to provide appropriate solutions incorporated in a holistic assessment with the above listed items.

Note:
Successful completion of relevant vendor training may be used to contribute to evidence on which competency is deemed. In these cases the alignment of outcomes of vendor training with performance criteria and critical aspects of evidence shall be clearly identified.

Context of and specific resources for assessment

9.3)

This unit should be assessed as it relates to normal work practice using procedures, information and resources typical of a workplace. This should include:

- OHS policy and work procedures and instructions.
- Suitable work environment, facilities, equipment and materials to undertake actual work as prescribed in this unit.

These should be used in the formal learning/assessment environment.

Note:

Where simulation is considered a suitable strategy for assessment, conditions for assessment must be authentic and as far as possible reproduce and replicate the workplace and be consistent with the approved industry simulation policy.

The resources used for assessment should reflect current industry practices in relation to complying with scheduled and

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	preventative maintenance program processes.
Method of assessment	**9.4)** This unit shall be assessed by methods given in Volume 1, Part 3 'Assessment Guidelines'. Note: Competent performance with inherent safe working practices is expected in the Industry to which this unit applies. This requires that the specified essential knowledge and associated skills are assessed in a structured environment which is primarily intended for learning/assessment and incorporates all necessary equipment and facilities for learners to develop and demonstrate the essential knowledge and skills described in this unit.
Concurrent assessment and relationship with other units	**9.5)** There are no concurrent assessment recommendations for this unit.

Range Statement

RANGE STATEMENT

10) This relates to the unit as a whole providing the range of contexts and conditions to which the performance criteria apply. It allows for different work environments and situations that will affect performance.

This unit shall be demonstrated in relation to scheduled and preventative maintenance compliance processes of at least three different items of installed equipment in the any of the following electrotechnology disciplines.

- Appliances
- Business equipment
- Computers
- Data Communications
- Electrical
- Electrical Machines
- Electronics
- Fire protection

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RANGE STATEMENT

- Instrumentation
- Lifts
- Mining, electrical
- Marine, electrical
- Refrigeration and Air Conditioning
- Uninterruptible power supplies (UPS)
- Stand alone generator sets
- Renewable / sustainable energy
- Security technology

Generic terms used throughout this Vocational Standard shall be regarded as part of the Range Statement in which competency is demonstrated. The definition of these and other terms that apply are given in Volume 2, Part 2.1.

Unit Sector(s)

Not Applicable

Competency Field

Competency Field **11)**

Electrotechnology

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UEENEEE020B Provide basic instruction in the use of electrotechnology apparatus

Modification History

Not Applicable

Unit Descriptor

Unit Descriptor **1) Scope:**

1.1) Descriptor

This unit covers instructing customers/users in the use of electrotechnology apparatus. It encompasses appropriate customer relations, the use of apparatus manufacturer's instruction material, basic instruction methods and evaluation and completing documentation.

Application of the Unit

Application of the Unit **2)**

This unit is intended for competency development entry-level employment based programs incorporated in approved contracts of training.

Licensing/Regulatory Information

License to practice **3)**

The skills and knowledge described in this unit do not require a license to practice in the workplace. However, practice in this unit is subject to regulations directly related to occupational health and safety and where applicable contracts of training such as apprenticeships.

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Pre-Requisites

Prerequisite Unit(s) **4)**

Competencies **4.1)**

There are no prerequisite competencies for this unit.

Literacy and numeracy skills **4.2)**

Participants are best equipped to achieve competency in this unit if they have reading, writing and numeracy skills indicated by the following scales. Description of each scale is given in Volume 2, Part 3 'Literacy and Numeracy'

Reading 3 Writing 3 Numeracy 3

Employability Skills Information

Employability Skills **5)**

This unit contains Employability Skills

The required outcomes described in this unit of competency contain applicable facets of Employability Skills. The Employability Skills Summary of the qualification in which this unit of competency is packaged will assist in identifying Employability Skill requirements.

Elements and Performance Criteria Pre-Content

6) Elements describe the essential outcomes of a unit of competency	Performance criteria describe the required performance needed to demonstrate achievement of the Element. Assessment of performance is to be consistent with the evidence guide.

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Elements and Performance Criteria

ELEMENT	PERFORMANCE CRITERIA
1 Prepare to instruct users.	1.1 OHS procedures for a given work area are obtained and understood through established routines and procedures.
	1.2 Established OHS risk control measures and procedures in preparation for the work are followed.
	1.3 Apparatus on which users are to be instructed is confirmed with work supervisor and/or other appropriate person(s).
	1.4 Safety features and safe use of the apparatus are reviewed by and understood.
	1.5 Familiarity with the apparatus is gained by reference to manufacturer's user material and a preliminary run through to ensure the process is understood.
	1.6 Materials required to instruct are obtained in accordance with established routines and procedures.
2 Instruct users.	2.1 Users are informed of all the safety features and safe use of the apparatus in accordance with manufacturer's instruction and regulatory requirements.
	2.2 Users are instructed in the set up and use of the apparatus in accordance with manufacturer's instruction.
	2.3 Users are given the opportunity to show that they understand the safety aspects, set up features and operation of the apparatus.
	2.4 A copy of the apparatus manufacturer's user instruction and other related documentation is given the appropriate person(s).
	2.5 Procedures for referring non-routine events to immediate supervisor for directions are followed.

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ELEMENT	PERFORMANCE CRITERIA
	2.6 Instructions are given efficiently without damage to apparatus, the surrounding environment or services and using sustainable energy practices.

Required Skills and Knowledge

REQUIRED SKILLS AND KNOWLEDGE

8) This describes the essential skills and knowledge and their level, required for this unit.

Evidence shall show that knowledge has been acquired of safe working practices and providing basic instruction in the use of electrotechnology apparatus

All knowledge and skills detailed in this unit should be contextualised to current industry practices and technologies.

KS01-EE20B User instructions techniques

Evidence shall show an understanding of instructing users in the use of specific items of equipment and systems to an extent indicated by the following aspects:

T1 Methods for evaluating user needs - how equipment is used efficiently and safely and identifying wear and tear and damage to the equipment that requires repairing.

T2 Basic instruction methods - appropriate to the culture of the users and the equipment for which instruction is given.

T3 Methods for evaluating user's ability use equipment correctly

T4 Communicating with personnel encompassing:

- Oral communications
- Written procedures and work instructions

T5 Communicating with suppliers

T6 Communicating with customers

T7 Purpose and extent of maintaining work activities records in an enterprise encompassing:

- Types of records for maintaining work activities in an enterprise
- Methods for recording and maintaining work records
- Work records required by regulation requirements

T8 Customer relations encompassing:

- Purpose

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REQUIRED SKILLS AND KNOWLEDGE

- Procedures for dealing with customers
- Dealing with customer issues

Evidence Guide

EVIDENCE GUIDE

9) The evidence guide provides advice on assessment and must be read in conjunction with the Performance Criteria, Required Skills and Knowledge, the Range Statement and the Assessment Guidelines for this Training Package.

The Evidence Guide forms an integral part of this unit. It must be used in conjunction with all parts of the unit and performed in accordance with the Assessment Guidelines of this Training Package.

Overview of Assessment

9.1)

Longitudinal competency development approaches to assessment, such as Profiling, require data to be reliably gathered in a form that can be consistently interpreted over time. This approach is best utilised in Apprenticeship programs and reduces assessment intervention. It is the industry-preferred model for apprenticeships. However, where summative (or final) assessment is used it is to include the application of the competency in the normal work environment or, at a minimum, the application of the competency in a realistically simulated work environment. It is recognised that, in some circumstances, assessment in part or full can occur outside the workplace. However, it must be in accordance with industry and regulatory policy.

Methods chosen for a particular assessment will be influenced by various factors. These include the extent of the assessment, the most effective locations for the assessment activities to take place, access to physical resources, additional safety measures that may be required and the critical nature of the competencies being assessed.

The critical safety nature of working with electricity, electrical equipment, gas or any other hazardous substance/material carries risk in deeming a person competent. Sources of evidence need to be 'rich' in nature to minimise error in judgment.

Activities associated with normal everyday work have a bearing on the decision as to how much and how detailed the data gathered will contribute to its 'richness'. Some skills are more

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EVIDENCE GUIDE

critical to safety and operational requirements while the same skills may be more or less frequently practised. These points are raised for the assessors to consider when choosing an assessment method and developing assessment instruments. Sample assessment instruments are included for Assessors in the Assessment Guidelines of this Training Package.

Critical aspects of evidence required to demonstrate competency in this unit

9.2)

Before the critical aspects of evidence are considered all prerequisites must be met.

Evidence for competence in this unit shall be considered holistically. Each element and associated performance criteria shall be demonstrated on at least two occasions in accordance with the 'Assessment Guidelines - UEE07'. Evidence shall also comprise:

- A representative body of work performance demonstrated within the timeframes typically expected of the discipline, work function and industrial environment. In particular this shall incorporate evidence that shows a candidate is able to:
  - Implement Occupational Health and Safety workplace procedures and practices, including the use of risk control measures as specified in the performance criteria and range statement
  - Apply sustainable energy principles and practices as specified in the performance criteria and range statement
  - Demonstrate an understanding of the essential knowledge and associated skills as described in this unit. It may be required by some jurisdictions that RTOs provide a percentile graded result for the purpose of regulatory or licensing requirements.
  - Demonstrate an appropriate level of skills enabling employment
  - Conduct work observing the relevant Anti Discrimination legislation, regulations, polices and workplace procedures
- Demonstrated consistent performance across a representative range of contexts from the prescribed items below:
  - Provide basic instruction in the use of electrotechnology apparatus as described in 8) and including:

    A Following manufacturer's user instructions.

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EVIDENCE GUIDE

B Giving clear instructions in the use of the apparatus.

C Giving users the opportunity to show that they understand the safe use of the apparatus.

D Dealing with unplanned events by drawing on essential knowledge and skills to provide appropriate solutions incorporated in a holistic assessment with the above listed items.

Note:
Successful completion of relevant vendor training may be used to contribute to evidence on which competency is deemed. In these cases the alignment of outcomes of vendor training with performance criteria and critical aspects of evidence shall be clearly identified.

Context of and specific resources for assessment

9.3)

This unit should be assessed as it relates to normal work practice using procedures, information and resources typical of a workplace. This should include:

- OHS policy and work procedures and instructions.
- Suitable work environment, facilities, equipment and materials to undertake actual work as prescribed in this unit.

These should be used in the formal learning/assessment environment.

Note:

Where simulation is considered a suitable strategy for assessment, conditions for assessment must be authentic and as far as possible reproduce and replicate the workplace and be consistent with the approved industry simulation policy.

The resources used for assessment should reflect current industry practices in relation to providing basic instruction in the use of electrotechnology apparatus.

Method of assessment

9.4)

This unit shall be assessed by methods given in Volume 1, Part 3 'Assessment Guidelines'.

Note:
Competent performance with inherent safe working practices is expected in the Industry to which this unit applies. This requires

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EVIDENCE GUIDE

	that the specified essential knowledge and associated skills are assessed in a structured environment which is primarily intended for learning/assessment and incorporates all necessary equipment and facilities for learners to develop and demonstrate the essential knowledge and skills described in this unit.
Concurrent assessment and relationship with other units	**9.5)** For optimisation of training and assessment effort, competence in this unit may be assessed concurrently with other related units making up a qualification or possible skill clusters covering a unit or units that require formal documentation. Components of this unit are included in the critical aspects of evidence of all units to help ensure the appropriate level of responsibility for safety has been acquired.

Range Statement

RANGE STATEMENT

10) This relates to the unit as a whole providing the range of contexts and conditions to which the performance criteria apply. It allows for different work environments and situations that will affect performance.

This unit shall be demonstrated in relation to any single item of electrotechnology apparatus and its control.

Generic terms used throughout this Vocational Standard shall be regarded as part of the Range Statement in which competency is demonstrated. The definition of these and other terms that apply are given in Volume 2, part 2.1.

Unit Sector(s)

Not Applicable

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Competency Field

Competency Field **11)**

Electrotechnology

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UEENEEE038B Participate in development and follow a personal competency development plan

Modification History

Not Applicable

Unit Descriptor

Unit Descriptor **1) Scope:**

1.1) Descriptor

This unit covers the application of skills and knowledge in taking responsibility for one's own competency development. It encompasses understanding the structure of a competency development plan, participating the development of a personal competency development plan, understanding responsibilities and obligation under competency development plan, following activities for developing competency, self-monitoring competency development and meeting trainee obligations for periodic reporting of competency development activities.

Application of the Unit

Application of the Unit **2)**

This unit is intended to support competency development entry-level employment and post qualification based programs incorporated in approved contracts of training and approved programs.

Licensing/Regulatory Information

License to practice **3)**

The skills and knowledge described in this unit do not require a license to practice in the workplace. However, practice in this unit is subject to regulations directly

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related to occupational health and safety and where applicable contracts of training such as apprenticeships.

Pre-Requisites

Prerequisite Unit(s) **4)**

Competencies **4.1)**

There are no prerequisite competencies for this unit.

Literacy and numeracy skills **4.2)**

Participants are best equipped to achieve competency in this unit if they have reading, writing and numeracy skills indicated by the following scales. Description of each scale is given in Volume 2, Part 3 'Literacy and Numeracy'

Reading 3 Writing 3 Numeracy 3

Employability Skills Information

Employability Skills **5)**

This unit contains Employability Skills

The required outcomes described in this unit of competency contain applicable facets of Employability Skills. The Employability Skills Summary of the qualification in which this unit of competency is packaged will assist in identifying Employability Skill requirements.

Elements and Performance Criteria Pre-Content

6) Elements describe the essential outcomes of a unit of competency

Performance criteria describe the required performance needed to demonstrate achievement of the Element. Assessment of performance is to be consistent with the evidence guide.

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Elements and Performance Criteria

ELEMENT	PERFORMANCE CRITERIA
1 Participate in the development of a personal competency development plan.	1.1 The nature of competency-based training is sought from discussions with appropriate persons and understood.
	1.2 The responsibilities/obligations of trainees/learners, their employers, trainers and assessors in a competency-based development program are sought from discussions with appropriate persons and understood.
	1.3 Competencies to be achieved in a personal competency development plan are established in discussions with appropriate persons.
	1.4 Details on how to achieve the individual competencies in the plan are sought from discussions with appropriate persons and understood.
2 Follow a personal competency development plan.	2.1 All aspects of the competency development plan are put into practice and followed diligently.
	2.2 Opportunities to practise skills and apply knowledge relative to a particular competency are pursued
	2.3 Assistance is sought from appropriate persons to overcome difficulties in develop skills and apply knowledge relevant to a particular competency.
	2.4 Progress in competency development is self monitored against the competency development plan.
	2.5 Modifications to the personal competency development plan are made in consultation with appropriate persons.
	2.6 Trainee/learners responsibility for periodic and timely reporting of competency development activities is followed.

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Required Skills and Knowledge

REQUIRED SKILLS AND KNOWLEDGE

8) This describes the essential skills and knowledge and their level, required for this unit.

Evidence shall show that knowledge has been acquired of safe working practices and participating in development and following a personal competency development plan.

All knowledge and skills detailed in this unit should be contextualised to current industry practices and technologies.

KS01-EE038B Responsibilities under a competency development plan

Evidence shall show an understanding of responsibilities under a competency development plan to an extent indicated by the following aspects:

- Competency Development (Training) Plans encompassing:
  - state/territories requirements (acts/regulations)
  - competency development (training) contracts
  - competency development (training) period
  - purpose of competency development (training) plans
  - process in developing competency development (training) plans
  - parties involved in the competency development (training) plan
- Qualification Structure encompassing:
  - scope of work
  - Training Packages - electrotechnology
  - competency standard units (CSUs)
  - structure of Qualification
  - off-Job Requirements
  - on-Job Requirements
- Responsibilities of Parties to the contract encompassing:
  - employer responsibilities
  - learner responsibilities
  - RTO responsibilities
  - State Training Authorities (STA)
- Electrotechnology Industry Career Opportunities encompassing:
  - industry Areas
  - qualification levels
  - career paths
- Industry customs and practices encompassing:

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REQUIRED SKILLS AND KNOWLEDGE

- industry bodies – employer and employee representatives
- regulatory bodies – including licensing/registration, OHS, IR, training authorities – apprentice/trainee regulation
- vocational and technical education system – Australian Qualification Framework (AQF), credentials, Australian Qualification Training Framework (AQTF)

- Monitoring of Workplace Evidence encompassing:
  - workplace exposure and practices and relationship with competency standard units
  - methods of collecting workplace evidence
  - monitoring period cycle
  - requirements of workplace evidence
  - actions taken for unsatisfactory progression
  - role of state training authority (STA)
  - apprentice/learner responsibilities
  - employer responsibilities
- RTO Policies encompassing:
  - apprentice/Learner Responsibilities
  - teachers/Trainers Responsibilities
  - absenteeism
  - off-Job component assessment specifications
  - on-Job component assessment specifications
  - qualification completion requirements and award
  - advanced standing and/or RPL
  - result review procedures
- Apprentice/Learner Discipline Policy encompassing:
  - apprentices/Learners rights
  - apprentice/Learner responsibilities
  - breaches of discipline
  - types of penalties Apprentice/Learner Responsibilities
- Attendance at the Vocational and Technical Education Centre encompassing:
  - importance of attendance
  - record management of attendance
  - attendance cards
  - advice to employer of absences
- Fire and Emergencies at the Vocational and Technical Education Centre encompassing:
  - designated fire and emergency exists
  - procedures in the event of a fire

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REQUIRED SKILLS AND KNOWLEDGE

- evacuation procedures
- assembly points importance of attendance

- Occupational Health and Safety at the Vocational and Technical Education Centre encompassing:
  - eye protection
  - foot protection
  - protective clothing
  - personal injuries
  - mobile phones and personal belonging
  - dress regulations
  - rotating machinery, designated fire and emergency exists
- Entry Requirements encompassing:
  - numeracy requirements
  - literacy requirements
  - vocational and technical education centre support mechanisms
  - testing and appropriate action by learner Eye protection
- Vocational and Technical Education Centre Tour encompassing:
  - vocational and technical education centre layout
  - building layout
  - tour of building and vocational and technical education centre

KS02-EE038B Methods of monitoring and reporting competency development activities

- Evidence shall show an understanding of methods of monitoring and reporting workplace activities indicated by the following aspects:
- RTOs responsibility to receive and monitor workplace activities of the apprentice/learner
- Industry requirements for monitoring workplace evidence
- Acceptable methods for monitoring and reporting workplace activities
- Apprentice's/Learner's responsibility to participate in the reporting of workplace activities
- RTOs requirements in periodically evaluating development of apprentices/learners from the workplace activities information gathered, and providing feedback and advice on areas requiring improvement
- Employers responsibilities to participate in monitoring, reporting and confirming workplace activities, and assisting in overcoming areas requiring development by the apprentice/learner
- Options for appeal or assistance from RTO or State Training Authority (STA)

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Evidence Guide

EVIDENCE GUIDE

9) The evidence guide provides advice on assessment and must be read in conjunction with the Performance Criteria, Required Skills and Knowledge, the Range Statement and the Assessment Guidelines for this Training Package.

The Evidence Guide forms an integral part of this unit. It must be used in conjunction with all parts of the unit and performed in accordance with the Assessment Guidelines of this Training Package.

Overview of Assessment

9.1)

Longitudinal competency development approaches to assessment, such as Profiling, require data to be reliably gathered in a form that can be consistently interpreted over time. This approach is best utilised in Apprenticeship programs and reduces assessment intervention. It is the industry-preferred model for apprenticeships. However, where summative (or final) assessment is used it is to include the application of the competency in the normal work environment or, at a minimum, the application of the competency in a realistically simulated work environment. It is recognised that, in some circumstances, assessment in part or full can occur outside the workplace. However, it must be in accordance with industry and regulatory policy.

Methods chosen for a particular assessment will be influenced by various factors. These include the extent of the assessment, the most effective locations for the assessment activities to take place, access to physical resources, additional safety measures that may be required and the critical nature of the competencies being assessed.

The critical safety nature of working with electricity, electrical equipment, gas or any other hazardous substance/material carries risk in deeming a person competent. Sources of evidence need to be 'rich' in nature to minimise error in judgment.

Activities associated with normal everyday work have a bearing on the decision as to how much and how detailed the data gathered will contribute to its 'richness'. Some skills are more critical to safety and operational requirements while the same skills may be more or less frequently practised. These points are raised for the assessors to consider when choosing an assessment method and developing assessment instruments. Sample assessment instruments are included for Assessors in the Assessment Guidelines of this Training Package.

Critical aspects of

9.2)

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EVIDENCE GUIDE

evidence required to demonstrate competency in this unit

Before the critical aspects of evidence are considered all prerequisites must be met.

Evidence for competence in this unit shall be considered holistically. Each element and associated performance criteria shall be demonstrated on at least two occasions in accordance with the 'Assessment Guidelines - UEE07'. Evidence shall also comprise:

- A representative body of work performance demonstrated within the timeframes typically expected of the discipline, work function and industrial environment. In particular this shall incorporate evidence that shows a candidate is able to:
  - Implement Occupational Health and Safety workplace procedures and practices, including the use of risk control measures as specified in the performance criteria and range statement
  - Apply sustainable energy principles and practices as specified in the performance criteria and range statement
  - Demonstrate an understanding of the essential knowledge and associated skills as described in this unit. It may be required by some jurisdictions that RTOs provide a percentile graded result for the purpose of regulatory or licensing requirements.
  - Demonstrate an appropriate level of skills enabling employment
  - Conduct work observing the relevant Anti Discrimination legislation, regulations, polices and workplace procedures
- Demonstrated consistent performance across a representative range of contexts from the prescribed items below:
  - Participate in development and follow a personal competency development plan as described in 8) and including:

    A Seeking and understanding the responsibilities under a competency development plan.

    B Seeking and understanding how to achieve the individual competencies in the plan.

    C Following all aspects of the plan diligently.

    D Pursuing opportunities to develop competency.

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EVIDENCE GUIDE

E Seeking assistance to overcome difficulties in developing competency.

F Self-monitoring competency development.

G Periodically reporting competency development activities.

H Dealing with unplanned events by drawing on essential knowledge and skills to provide appropriate solutions incorporated in a holistic assessment with the above listed items.

Context of and specific resources for assessment

9.3)

This unit should be assessed as it relates to normal work practice using procedures, information and resources typical of a workplace. This should include:

- OHS policy and work procedures and instructions.
- Suitable work environment, facilities, equipment and materials to undertake actual work as prescribed in this unit.

These should be used in the formal learning/assessment environment.

Note:

Where simulation is considered a suitable strategy for assessment, conditions for assessment must be authentic and as far as possible reproduce and replicate the workplace and be consistent with the approved industry simulation policy.

The resources used for assessment should reflect current industry practices in relation to participating in development and following a personal competency development plan.

Method of assessment

9.4)

This unit shall be assessed by methods given in Volume 1, Part 3 'Assessment Guidelines'.

Note:
Competent performance with inherent safe working practices is expected in the Industry to which this unit applies. This requires that the specified essential knowledge and associated skills are assessed in a structured environment which is primarily intended for learning/assessment and incorporates all necessary equipment and facilities for learners to develop and demonstrate the essential knowledge and skills described in this unit.

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EVIDENCE GUIDE

Concurrent assessment and relationship with other units	**9.5)** For optimisation of training and assessment effort, competence development in this unit may be assessed concurrently with other units in a qualification.

Range Statement

RANGE STATEMENT

10) This relates to the unit as a whole providing the range of contexts and conditions to which the performance criteria apply. It allows for different work environments and situations that will affect performance.

This unit shall be demonstrated in relation to participating in development and follow a personal competency development plan in an electrotechnology discipline with the following attributes:

- responsibility for one's own competency development in developing and applying skills and knowledge
- structure of a competency development plan
- development of a personal competency development plan participation
- responsibilities and obligation under the competency development plan
- activities for developing competency followed
- competency development self-monitoring
- trainee obligations met
- periodic reporting of competency development activities met

Participating in development and follow a personal competency development plan shall be demonstrated in any of the following Electrotechnology disciplines:

- Automation technologies
- Computers
- Data Communications
- Electrical
- Electrical Machines
- Electronics
- Fire protection
- Instrumentation

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RANGE STATEMENT

- Refrigeration and Air Conditioning
- Renewable / sustainable energy
- Security technology

Generic terms used throughout this Vocational Standard shall be regarded as part of the Range Statement in which competency is demonstrated. The definition of these and other terms that apply are given in Volume 2, Part 2.1.

Unit Sector(s)

Not Applicable

Competency Field

Competency Field **11)**

Electrotechnology

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UEENEEE101A Apply Occupational Health and Safety regulations, codes and practices in the workplace

Modification History

Not Applicable

Unit Descriptor

Unit Descriptor **1**)

1.1) Descriptor

This unit specifies the mandatory requirements of occupational health and safety and how they apply to the various electrotechnology work functions. It encompasses responsibilities for health and safety, risk management processes at all operative levels and adherence to safety practices as part of the normal way of doing work.

Application of the Unit

Not Applicable

Licensing/Regulatory Information

1.2) License to practice

During Training: Competency development activities are subject to regulations directly related to licencing, occupational health and safety and where applicable contracts of training such as apprenticeships.

In the workplace: The application of the skills and knowledge described in this unit require a license to practice in the workplace where work is carried out on electrical equipment or installations which are designed to operate at voltages greater than 50 V a.c. or 120 V d.c.

Other conditions may apply under State and Territory legislative and regulatory requirements.

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Pre-Requisites

Prerequisite Unit(s) **2)**

2.1) Competencies

There are no prerequisite competencies for this unit.

Employability Skills Information

Employability Skills **3)**

This unit contains Employability Skills

The required outcomes described in this unit of competency contain applicable facets of Employability Skills. The Employability Skills Summary of the qualification in which this unit of competency is packaged will assist in identifying Employability Skill requirements.

Application of the Unit **4)**

This unit addresses information, processes and techniques for the application of general occupational health and safety requirements in workplaces and is essential for employees without managerial or supervisory responsibilities

Elements and Performance Criteria Pre-Content

6) Elements describe the essential outcomes of a unit of competency

Elements and Performance Criteria

ELEMENT	PERFORMANCE CRITERIA
1 Prepare to enter a	1.1 Work area access permits are obtained from appropriate personnel according to established

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ELEMENT	PERFORMANCE CRITERIA	
work area		procedures
	1.2	Safe work methods for controlling risk obtained, read and understood prior to undertaking a work activity.
	1.3.	Preparations for electrical and non-electrical isolation are carried out to prevent creation of hazards from loss of machine/system/process control according to established procedures.
	1.4	Tools and equipment needed for the work are checked for safety and correct functionality according to established procedures and regulatory requirements.
2 Apply safe working practices.	2.1	Safe work methods for controlling risk are followed accurately.
	2.2	Workplace procedures for dealing with accidents, fires and emergencies are followed according to work procedures and scope of responsibility and competencies.
3. Follow workplace procedures for hazard identification and risk control	3.1	Hazards are identified and control measures implemented and monitored through active participation in the consultation process with employer and other employees.
	3.2	Hazards in the work area are recognised and reported to appropriate personnel according to established procedures.
	3.3	OHS records of incidents are completed in accordance with regulatory requirements and established procedures.
	3.4	Workplace instructions and training are followed accurately within established procedures.

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Required Skills and Knowledge

REQUIRED SKILLS AND KNOWLEDGE

7) This describes the essential skills and knowledge and their level, required for this unit.

Evidence shall show that knowledge has been acquired of safe working practices and applying OHS practices in the workplace.

The knowledge and skills shall be contextualised to current industry standards, technologies and practices.

KS01-EE101A Occupational Health and Safety principles

Evidence shall show an understanding of Occupational Health and Safety to an extent indicated by the following aspects

T1 The basic legal requirements covering occupational health and safety in the workplace encompassing:

- underlying principles of OH&S
- general aims and objectives of the relevant state or territory legislation relating to OH&S.
- employer and employee responsibilities, rights and obligations.
- major functions of safety committees and representatives.
- powers given to Occupational Health and Safety Inspectors
- housekeeping and potential hazards in relation to improper housekeeping
- selecting appropriate personal protective equipment (PPE) given hazardous situations

T2 The work environment encompassing:

- typical hazards associated with a range of work environments
- procedures used to control the risks associated with these hazards
- principles of risk assessment / management and state the purpose of each.
- hierarchy of OH&S hazard control measures.
- required documentation for risk assessment.
- commonly used workplace safety signs.
- workplace emergencies that pose a threat to health and safety and suitable procedure for an emergency workplace evacuation.
- appropriate fire extinguisher for a given type of fire.
- requirements for the location, mounting and maintenance of portable fire extinguishers.
- basic process of fighting a fire.
- Importance of safe premises, buildings and security in an industrial setting and the consequences of non- compliance.
- standard work procedure.

T3 Manual Handling encompassing:

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REQUIRED SKILLS AND KNOWLEDGE

- typical manual handling injuries and the effect they can have on lifestyle
- situations that may cause manual handling injuries
- correct procedures for lifting and carrying to prevent manual handling injuries

T4 Chemicals in the workplace encompassing:

- hazardous substances and dangerous goods.
- classification of chemicals as hazardous substances and/or dangerous goods
- requirements for labelling of chemicals in the workplace
- safe storage procedures for chemicals
- purpose and interpretation of material safety data sheet (MSDS)

T5 Working at heights encompassing:

- dangers associated with working on ladders and scaffolds
- identification of work area as a height risk and use appropriate safety equipment to prevent a fall
- selecting an appropriate ladder for a given situation and perform a safety check before use
- precautions that should be taken when ascending and working off a ladder
- precautions that should be taken when working on and around a scaffold and elevated platforms.

T6 Confined spaces encompassing:

- hazards associated with working in a confined space
- identifying workplace situations that could be classified as a confined space
- control measures for working in a designated confined space

T7 Physical and psychological hazards encompassing:

- short and long term effects of excessive noise and techniques to avoid damage to hearing due to excessive noise
- effects of vibration on the human body and work practices to protect against vibration
- effects of thermal stress on the human body and work practices to protect against thermal stress
- effects of ultraviolet (UV) radiation on the human body and work practices to protect against UV radiation.
- dangers associated with laser operated equipment and tools and suitable protective measures to overcome the danger.
- occupational overuse syndrome, how it occurs and means to overcome it
- factors that cause stress in the workplace, symptoms of a person suffering from stress and personal stress management techniques
- detrimental effects and dangers of drug and alcohol use in the workplace

T8 Working safely with electricity encompassing:

- effects of electric shock on the human body

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REQUIRED SKILLS AND KNOWLEDGE

- common causes of electrical accidents
- precautions that can minimise the chance of electric shock (earthing, extra low voltage, fuses, circuit breakers and residual current devices – RCDs)
- protection offered by a residual current device (RCD)
- need for ensuring the (safe) isolation of an electrical supply
- appropriate method of removing an electric shock victim from a live electrical situation

T9 Life support - CPR in the workplace encompassing:

- First Aid.
- responsibilities of the First Aider.
- priorities of first aid management for any accident or injury.
- procedures required at an accident scene.
- legal and ethical issues, which may impact on the management of care.
- 'Duty of Care'.
- examination of a casualty for injuries.
- effect of cardio pulmonary arrest on the body.
- Managing simulated conditions of: airway obstruction; respiratory arrest and cardio pulmonary arrest,
- single and two-person cardio pulmonary resuscitation (CPR).
- signs and symptoms of an altered level of consciousness
- management of simulation of a casualty with an altered level of consciousness.
- signs and symptoms of shock.
- management of simulation of a casualty in shock

Evidence Guide

EVIDENCE GUIDE

9) The evidence guide provides advice on assessment and must be read in conjunction with the Performance Criteria, Required Skills and Knowledge, the Range Statement and the Assessment Guidelines for this Training Package.

The Evidence Guide forms an integral part of this unit. It must be used in conjunction with all parts of the unit and performed in accordance with the Assessment Guidelines of this Training Package.

Overview of Assessment	**9.1**) Longitudinal competency development approaches to assessment, such as Profiling, require data to be reliably gathered in a form that can be consistently interpreted over

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EVIDENCE GUIDE

time. This approach is best utilised in Apprenticeship programs and reduces assessment intervention. It is the industry-preferred model for apprenticeships. However, where summative (or final) assessment is used it is to include the application of the competency in the normal work environment or, at a minimum, the application of the competency in a realistically simulated work environment. It is recognised that, in some circumstances, assessment in part or full can occur outside the workplace. However, it must be in accordance with industry and regulatory policy.

Methods chosen for a particular assessment will be influenced by various factors. These include the extent of the assessment, the most effective locations for the assessment activities to take place, access to physical resources, additional safety measures that may be required and the critical nature of the competencies being assessed.

The critical safety nature of working with electricity, electrical equipment, gas or any other hazardous substance/material carries risk in deeming a person competent. Sources of evidence need to be 'rich' in nature to minimise error in judgment.

Activities associated with normal everyday work have a bearing on the decision as to how much and how detailed the data gathered will contribute to its 'richness'. Some skills are more critical to safety and operational requirements while the same skills may be more or less frequently practised. These points are raised for the assessors to consider when choosing an assessment method and developing assessment instruments. Sample assessment instruments are included for Assessors in the Assessment Guidelines of this Training Package.

Critical aspects of evidence required to demonstrate competency in this unit

9.2)

Before the critical aspects of evidence are considered all prerequisites must be met.

Evidence for competence in this unit shall be considered holistically. Each element and associated performance criteria shall be demonstrated on at least two occasions in accordance with the 'Assessment Guidelines - UEE07'. Evidence shall also comprise:

- A representative body of work performance demonstrated within the timeframes typically expected of the discipline, work function and industrial environment. In particular this shall incorporate evidence that shows a candidate is able

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EVIDENCE GUIDE

to:

- Implement Occupational Health and Safety workplace procedures and practices, including the use of risk control measures as specified in the performance criteria and range statement encompassing:
- Apply sustainable energy principles and practices as specified in the performance criteria and range statement
- Demonstrate an understanding of the essential knowledge and associated skills as described in this unit. It may be required by some jurisdictions that RTOs provide a percentile graded result for the purpose of regulatory or licensing requirements.
- Demonstrate an appropriate level of skills enabling employment
- Conduct work observing the relevant Anti Discrimination legislation, regulations, polices and workplace procedures

- Demonstrated consistent performance across a representative range of contexts from the prescribed items below:
  - Applying OHS practices in the workplace as described in 8) and including:

A Preparing to enter the workplace including, the use of work permits and clearances and isolation permissions.

B Understanding and following risk control safe work methods.

C Applying work procedures and instructions as they apply to risk control measures.

D Dealing with accidents and emergencies within the scope of responsibility.

E Participation in consultation processes, identifying hazards and implementing and monitoring control measures.

F Dealing with unplanned events

Note:
Ability to implement these Occupation Health and Safety

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EVIDENCE GUIDE

measures shall be demonstrated on all occasions safety issues arise.

Context of and specific resources for assessment

9.3)

This unit should be assessed as it relates to normal work practice using procedures, information and resources typical of a workplace. This should include:

- OHS policy and work procedures and instructions.
- Suitable work environment, facilities, equipment and materials to undertake actual work as prescribed in this unit.

These should be used in the formal learning/assessment environment.

Note:

Where simulation is considered a suitable strategy for assessment, conditions for assessment must be authentic and as far as possible reproduce and replicate the workplace and be consistent with the approved industry simulation policy.

The resources used for assessment should reflect current industry practices in relation to applying OHS practices in the workplace.

Method of assessment

9.4)

This unit shall be assessed by methods given in Volume 1, Part 3 'Assessment Guidelines'.

Note:
Competent performance with inherent safe working practices is expected in the Industry to which this unit applies. This requires that the specified essential knowledge and associated skills are assessed in a structured environment which is primarily intended for learning/assessment and incorporates all necessary equipment and facilities for learners to develop and demonstrate the essential knowledge and skills described in this unit.

Concurrent assessment and relationship with other units

9.5)

This unit shall be assessed concurrently, as it relates to other units undertaken in a possible skill clusters or qualification.

Components of this unit are included in the critical aspects of evidence of all units to help ensure the appropriate level of responsibility for safety has been acquired

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Range Statement

RANGE STATEMENT

8) This relates to the unit as a whole providing the range of contexts and conditions to which the performance criteria apply. It allows for different work environments and situations that will affect performance.

This unit shall be demonstrated in relation to each of the following

- Relevant Occupational Health and Safety legislation, regulations and codes of practice related to hazards present in the industry and particular workplace
- Accepted industry work procedures and the specific safety procedures and work instructions for particular workplace.

Generic terms used throughout this Vocational Standard shall be regarded as part of the Range Statement in which competency is demonstrated. The definition of these and other terms that apply are given in Volume 2, Part 2.1.

Unit Sector(s)

Not Applicable

Competency Field

2.2) Literacy and numeracy skills

Participants are best equipped to achieve competency in this unit if they have reading, writing and numeracy skills indicated by the following scales. Description of each scale is given in Volume 2, Part 3 'Literacy and Numeracy'

Reading	3	Writing	3	Numeracy	3

Custom Content Section

Competency Field 5)

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Competency Field 5)

Electrotechnology

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UEENEEE102A Fabricate, assemble and dismantle utilities industry components

Modification History

Not Applicable

Unit Descriptor

Unit Descriptor **1**)

1.1) Descriptor

This unit covers basic fitting and fabrication techniques as they apply in the various utilities industry work functions. It encompasses the safe use of hand, fixed and portable power tools; cutting, shaping joining and fixing using metallic and non-metallic materials; dismantling and assembling equipment; basic mechanical measurement and marking-out and reading drawings/diagrams.

Application of the Unit

Not Applicable

Licensing/Regulatory Information

1.2) License to practice

During Training: Competency development activities are subject to regulations directly related to licencing, occupational health and safety and where applicable contracts of training such as apprenticeships.

In the workplace: The application of the skills and knowledge described in this unit require a license to practice in the workplace where work is carried out on electrical equipment or installations which are designed to operate at voltages greater than 50 V a.c. or 120 V d.c.

Other conditions may apply under State and Territory legislative and regulatory requirements.

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Pre-Requisites

Prerequisite Unit(s) **2)**

2.1) Competencies

Granting competency in this unit shall be made only after competency in the following unit(s) has/have been confirmed.

UEENEEE101A	Apply Occupational Health and Safety regulations, codes and practices in the workplace

Employability Skills Information

Employability Skills **3)**

This unit contains Employability Skills

The required outcomes described in this unit of competency contain applicable facets of Employability Skills. The Employability Skills Summary of the qualification in which this unit of competency is packaged will assist in identifying Employability Skill requirements.

Application of the Unit **4)**

4.1) General Application

This unit applies to persons entering work in utilities industry and may be used in school-based vocational programs.

4.2) Importation

RTOs wishing to import this unit into any qualification under the flexibility provisions of NQC Training Package Policy

Elements and Performance Criteria Pre-Content

6) Elements describe
the essential

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outcomes of a unit of competency

Elements and Performance Criteria

ELEMENT	PERFORMANCE CRITERIA
1 Prepare for dismantling, assembling and fabrication work.	1.1 OHS procedures for a given work area are obtained and understood through established routines and procedures.
	1.2 Established OHS risk control measures and procedures in preparation for the work are followed.
	1.3 Safety hazard not previously identified are reported and advice on risk control measures is sought from the work supervisor.
	1.4 The nature of the work is obtained from documentation and from work supervisor to establish the scope of work to be undertaken.
	1.5 Advice is sought from the work supervisor to ensure the work is coordinated effectively with others.
	1.6 Materials required for the work are obtained in accordance with established routines and procedures.
	1.7 Tools, equipment and measuring devices needed to carry out the work are obtained and checked for correct operation and safety.
	1.8 Cutting tools such as drills and chisels are sharpened to suit the material on which they are to be used.
2 Dismantle and assemble utilities industry apparatus.	2.1 Established OHS risk control measures and procedures for carrying out the work are followed.
	2.2 Circuits/machines/plant are checked as being isolated where necessary in strict accordance OHS requirements and procedures.
	2.3 Appropriate tools are selected and used correctly and safely in dismantling and assembling apparatus.
	2.4 Manufacturer apparatus dismantling and assembling guides are used where applicable.

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ELEMENT		PERFORMANCE CRITERIA	
		2.5	Components are marked or tagged during the dismantling to help ensure correct and efficient reassembly.
		2.6	Dismantled components and parts are stored to protect them against loss or damage.
		2.7	Apparatus is dismantled and assembled efficiently without waste of materials and energy and/or damage to apparatus and the surrounding environment or services.
		2.8	Procedures for referring non-routine events to immediate supervisor for directions are followed.
		2.9	Routine quality checks are carried out in accordance with work instructions.
		2.10	OHS risk control work completion measures and procedures are followed.
		2.11	Work site is cleaned and made safe in accordance with established procedures.
		2.12	Work supervisor is notified of the completion of the work in accordance with established procedures.
3	Fabricate utilities industry components.	3.1	Established OHS risk control measures and procedures for carrying out the work are followed.
		3.2	Circuits/machines/plant are checked as being isolated where necessary in strict accordance OHS requirements and procedures.
		3.3	Appropriate tools are selected and used correctly and safely in fabricating components.
		3.4	Drawings and instruction for the fabrication of components are followed.
		3.5	Component dimensions are determined directly or by calculation from information given in job drawings and instructions.
		3.6	Components are fabricated efficiently without waste of materials and energy and/or damage to the surrounding environment or services.

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ELEMENT	PERFORMANCE CRITERIA	
	3.7	Procedures for referring non-routine events to immediate supervisor for directions are followed.
	3.8	Routine quality checks are carried out in accordance with work instructions.
	3.9	OHS risk control work completion measures and procedures are followed.
	3.10	Work site is cleaned and made safe in accordance with established procedures.
	3.11	Work supervisor is notified of the completion of the work in accordance with established procedures.

Required Skills and Knowledge

REQUIRED SKILLS AND KNOWLEDGE

7) This describes the essential skills and knowledge and their level, required for this unit.

Evidence shall show that knowledge has been acquired of safe working practices and fabricating, dismantling, assembling of utilities industry components.

The knowledge and skills shall be contextualised to current industry standards, technologies and practices.

KS01-EE102A Hand and power tools and their application

Evidence shall show an understanding of hand and power tools and their application to an extent indicated by the following aspects:

T1 Mechanical drawing interpretation and sketching encompassing:

- drawing standards and conventions used in drawings of mechanical components as specified in AS1100
- basic abbreviations and symbols used in drawing of mechanical components
- interpretation of mechanical drawings commonly used in the electrotechnology industry (orthogonal projection, third angle - detail and assembly drawings, pictorial views)
- laying out a drawing of mechanical components using engineering drawing convention.
- freehand drawings of mechanical components showing all information needed for its manufacture/fabrication

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REQUIRED SKILLS AND KNOWLEDGE

T2 Workshop planning and materials encompassing:

- methods used to work safely in an industrial work environment.
- typical non-electrical hazards in the workplace
- control measures for dealing with hazards identified.
- Conducting a risk assessment on a given work environment, documenting and assessing the risks identified
- type of metallic and non-metallic materials used in the electrotechnology industry and application of the common materials
- planning process

T3 Measuring and marking out encompassing:

- reasons for measuring and marking out
- tools used for marking out
- measuring and marking out a project accurately following correct procedures.
- sustainable energy work practices related to reducing waste when marking out.

T4 Holding and cutting encompassing:

- common tools for holding (bench vices, multi-grips, vice grips, wrenches).
- common tools for cutting metallic and non-metallic material (hacksaws, wood saws, chisels, pliers, files)
- procedure for using a range of tools for cutting, shaping, and finishing metallic and non-metallic materials
- safety procedures when using holding and cutting tools

T5 Drills and drilling encompassing:

- types of drills used in the electrotechnology industry
- sharpening twist drills
- drilling metallic and non-metallic components
- safe use of a bench drill

T6 Tapping and threading encompassing:

- type and size of commonly used threads used in electrotechnology work
- taps and tap wrenches
- tapping metallic and non-metallic components
- stock and die tools
- threading metallic and non-metallic components

T7 General Hand Tools encompassing:

- hammers used in electrotechnology work
- screwdrivers used in electrotechnology work
- spanners and sockets used in electrotechnology work
- pliers used in electrotechnology work
- assembling components applicable to electrotechnology industry using a variety of

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REQUIRED SKILLS AND KNOWLEDGE

hand tools.

T8 Joining techniques encompassing:

- types of machine screws and nuts
- forms of welding (Oxy-acetylene, electric arc welding).
- forms of brazing and hard soldering
- process of soft soldering
- joining components using machine screws
- joining components using welding, brazing or soldering techniques

T9 Portable electric power tools encompassing:

- portable electric power tools (grinders, drills, jigsaws, saws)
- applications of portable electric power tools used in the electrotechnology work.
- using portable power tools.
- fabricating components using power tools (drills, grinders)

T10 Sheet metal work encompassing:

- types of sheet metal materials used in the electrotechnology work.
- names and applications of the types of fabrication materials.
- tools used with sheet metals in electrotechnology work (hacksaw, tinsnips, guillotines, punches, notching tools, folding machines)
- techniques used in fabricating sheet metal (cutting, bending, drilling/punching, joining, cutting mitres).
- marking out, cutting, bending, drilling and/or cutting and/or punching holes, joining and cutting mitred joints using sheet metal.
- sustainable energy work practices to reducing waste when fabricating using sheet metal.
- fabricating components using sheet metal and fabrication tools.

T11 Low tolerance measurement encompassing:

- tolerance
- techniques in using vernier callipers
- techniques in using micrometers.
- using vernier callipers to measure engineering components
- using micrometers to measuring engineering components

T12 Dismantling and assembly techniques encompassing:

- tools used in dismantling and assembling electrotechnology equipment (spanners, screwdrivers, bearing pullers, etc).
- procedures for ensuring the safe treatment of dismantled components.
- dismantling electrical, electronic, instrumentation or refrigeration/air conditioning piece of equipment using correct procedures.
- assembling electrical, electronic, instrumentation or refrigeration/air conditioning piece of equipment using correct procedures.

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Evidence Guide

EVIDENCE GUIDE

9) The evidence guide provides advice on assessment and must be read in conjunction with the Performance Criteria, Required Skills and Knowledge, the Range Statement and the Assessment Guidelines for this Training Package.

The Evidence Guide forms an integral part of this unit. It must be used in conjunction with all parts of the unit and performed in accordance with the Assessment Guidelines of this Training Package.

Overview of Assessment

9.**1**)

Longitudinal competency development approaches to assessment, such as Profiling, require data to be reliably gathered in a form that can be consistently interpreted over time. This approach is best utilised in Apprenticeship programs and reduces assessment intervention. It is the industry-preferred model for apprenticeships. However, where summative (or final) assessment is used it is to include the application of the competency in the normal work environment or, at a minimum, the application of the competency in a realistically simulated work environment. It is recognised that, in some circumstances, assessment in part or full can occur outside the workplace. However, it must be in accordance with industry and regulatory policy.

Methods chosen for a particular assessment will be influenced by various factors. These include the extent of the assessment, the most effective locations for the assessment activities to take place, access to physical resources, additional safety measures that may be required and the critical nature of the competencies being assessed.

The critical safety nature of working with electricity, electrical equipment, gas or any other hazardous substance/material carries risk in deeming a person competent. Sources of evidence need to be 'rich' in nature to minimise error in judgment.

Activities associated with normal everyday work have a bearing on the decision as to how much and how detailed the data gathered will contribute to its 'richness'. Some skills are more critical to safety and operational requirements while the same skills may be more or less frequently practised. These points are raised for the assessors to consider when choosing an assessment method and developing assessment instruments. Sample assessment instruments are included for Assessors in the

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Assessment Guidelines of this Training Package.

Critical aspects of evidence required to demonstrate competency in this unit

9.2)

Before the critical aspects of evidence are considered all prerequisites must be met.

Evidence for competence in this unit shall be considered holistically. Each element and associated performance criteria shall be demonstrated on at least two occasions in accordance with the 'Assessment Guidelines - UEE07'. Evidence shall also comprise:

- A representative body of work performance demonstrated within the timeframes typically expected of the discipline, work function and industrial environment. In particular this shall incorporate evidence that shows a candidate is able to:
  - Implement Occupational Health and Safety workplace procedures and practices, including the use of risk control measures as specified in the performance criteria and range statement
  - Apply sustainable energy principles and practices as specified in the performance criteria and range statement
  - Demonstrate an understanding of the essential knowledge and associated skills as described in this unit. It may be required by some jurisdictions that RTOs provide a percentile graded result for the purpose of regulatory or licensing requirements.
  - Demonstrate an appropriate level of skills enabling employment
  - Conduct work observing the relevant Anti Discrimination legislation, regulations, polices and workplace procedures
- Demonstrated consistent performance across a representative range of contexts from the prescribed items below:
  - Fabricate, dismantle, assemble of utilities industry components as described in 8) and including:

    A Selecting and using hand tools appropriate to a task correctly and safely

    B Selecting and using power tools appropriate to a task correctly and safely

    C Sharpening at least two drill bits each for use different types of material.

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EVIDENCE GUIDE

D Interpreting mechanical drawings/diagrams and instructions correctly.

E Dismantle and assemble an apparatus relevant to utilities industry discipline in which competency is sought.

F Fabricate a component relevant to the utilities industry discipline in which competency is sought.

G Dealing with unplanned events

Context of and specific resources for assessment

9.3)

This unit should be assessed as it relates to normal work practice using procedures, information and resources typical of a workplace. This should include:

- OHS policy and work procedures and instructions.
- Suitable work environment, facilities, equipment and materials to undertake actual work as prescribed in this unit.

These should be used in the formal learning/assessment environment.

Note:

Where simulation is considered a suitable strategy for assessment, conditions for assessment must be authentic and as far as possible reproduce and replicate the workplace and be consistent with the approved industry simulation policy.

The resources used for assessment should reflect current industry practices in relation to dismantling, assembling and fabricating utilities industry components.

Method of assessment

9.4)

This unit shall be assessed by methods given in Volume 1, Part 3 'Assessment Guidelines'.

Note:
Competent performance with inherent safe working practices is expected in the Industry to which this unit applies. This requires that the specified essential knowledge and associated skills are assessed in a structured environment which is primarily intended for learning/assessment and incorporates all necessary equipment and facilities for learners to develop and demonstrate the essential knowledge and skills described in this unit.

Concurrent

9.5)

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EVIDENCE GUIDE

assessment and relationship with other units	For optimisation of training and assessment effort, competency development in this unit may be arranged concurrently with unit:

Range Statement

RANGE STATEMENT

8) This relates to the unit as a whole providing the range of contexts and conditions to which the performance criteria apply. It allows for different work environments and situations that will affect performance.

This unit shall be demonstrated in relation to installation, fault finding, maintenance, repair or development work functions in any of the following disciplines:

- Electrotechnology Disciplines
- Gas industry Disciplines
- ESI Transmission, Distribution and Rail Disciplines
- ESI Generation Disciplines

Generic terms used throughout this Vocational Standard shall be regarded as part of the Range Statement in which competency is demonstrated. The definition of these and other terms that apply are given in Volume 2, Part 2.1.

Unit Sector(s)

Not Applicable

Competency Field

2.3) Literacy and numeracy skills

Participants are best equipped to achieve competency in this unit if they have reading, writing and numeracy skills indicated by the following scales. Description of each scale is given in Volume 2, Part 3 'Literacy and Numeracy'

Reading	3	Writing	3	Numeracy	3

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2.3) Literacy and numeracy skills

Competency Field **5)**

Utilities industry

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UEENEEE103A Solve problems in ELV single path circuits

Modification History

Not applicable.

Unit Descriptor

Unit Descriptor **1) Scope:**

1.1) Descriptor

This unit covers providing known solutions to predictable problems in single path circuits operated at extra-low voltage (ELV) as they apply to various energy sector work functions. It encompasses working safely, problem solving procedures, including the use of basic voltage, current and resistance measuring devices, providing known solutions to predictable circuit problems.

Application of the Unit

Application of the Unit **2)**

This unit shall apply to persons entering work in the energy sector and may be used in school-based vocational programs.

Licensing/Regulatory Information

License to practice **3)**

The skills and knowledge described in this unit do not require a license to practice in the workplace. However they are subject to regulations directly related to occupational health and safe and contracts of training such as new apprenticeships.

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Pre-Requisites

Prerequisite Unit(s) **4)**

Competencies **4.1)**

Granting competency in this unit shall be made only after competency in the following unit(s) has/have been confirmed.

UEENEEE101A	Apply Occupational Health and Safety regulations, codes and practices in the workplace

Literacy and numeracy skills **4.2)**

Participants are best equipped to achieve competency in this unit if they have reading, writing and numeracy skills indicated by the following scales. Description of each scale is given in Volume 2, Part 3 ‘Literacy and Numeracy’

Reading	3	Writing	3	Numeracy	3

Employability Skills Information

Employability Skills **5)**

This unit contains Employability Skills

The required outcomes described in this unit of competency contain applicable facets of Employability Skills. The Employability Skills Summary of the qualification in which this unit of competency is packaged will assist in identifying Employability Skill requirements.

Elements and Performance Criteria Pre-Content

6) Elements describe the essential outcomes of a competency standard unit	Performance Criteria describe the required performance needed to demonstrate achievement of the element. Assessment of performance is to be consistent with the

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Evidence Guide.

Elements and Performance Criteria

ELEMENT	PERFORMANCE CRITERIA
1 Prepare to work on extra-low voltage single path electrical circuits.	1.1 OHS procedures for a given work area are identified, obtained and understood.
	1.2 OHS risk control work preparation measures and procedures are followed.
	1.3 The nature of the circuit(s) problem is obtained from documentation or from work supervisor to establish the scope of work to be undertaken.
	1.4 Advice is sought from the work supervisor to ensure the work is coordinated effectively with others.
	1.5 Sources of materials that may be required for the work are identified and accessed in accordance with established procedures.
	1.6 Tools, equipment and testing devices needed to carry out the work are obtained and checked for correct operation and safety.
2 Solve problem in extra-low voltage single path electrical circuits.	2.1 OHS risk control work measures and procedures are followed.
	2.2 The need to test or measure live is determined in strict accordance with OHS requirements and when necessary conducted within established safety procedures.
	2.3 Circuits are checked as being isolated where necessary in strict accordance OHS requirements and procedures.
	2.4 Established routines are used to solve circuit problems using measured and calculated values as they apply to single path, single source circuits.
	2.5 Problems are solved without damage to apparatus, circuits, the surrounding environment

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ELEMENT	PERFORMANCE CRITERIA	
		or services and using sustainable energy practices.
3 Complete work and document problem solving activities.	3.1	OHS work completion risk control measures and procedures are followed.
	3.2	Work site is cleaned and made safe in accordance with established procedures.
	3.3	Justification for solutions used to solve circuit problems is documented.
	3.4	Work completion is documented and appropriate person(s) notified in accordance with established routine procedures.

Required Skills and Knowledge

REQUIRED SKILLS AND KNOWLEDGE

8) This describes the essential skills and knowledge and their level, required for this unit.

Evidence shall show that knowledge has been acquired of safe working practices and solving problems in extra-low voltage single path circuits.

All knowledge and skills detailed in this unit should be contextualised to current industry practices and technologies.

KS01-EE103A Single Path d.c. Circuits

Evidence shall show an understanding of single path d.c. circuits to an extent indicated by the following aspects:

T1 Basic electrical concepts encompassing:

- electrotechnology industry
- static and current electricity
- production of electricity by renewable and non renewable energy sources
- transportation of electricity from the source to the load via the transmission and distribution systems
- utilisation of electricity by the various loads
- basic calculations involving quantity of electricity, velocity and speed with relationship to the generation and transportation of electricity.

T2 Basic electrical circuit encompassing:

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REQUIRED SKILLS AND KNOWLEDGE

- symbols used to represent an electrical energy source, a load, a switch and a circuit protection device in a circuit diagram
- purpose of each component in the circuit
- effects of an open-circuit, a closed-circuit and a short-circuit
- multiple and sub-multiple units

T3 Ohm's Law encompassing:

- basic d.c. single path circuit.
- voltage and currents levels in a basic d.c. single path circuit.
- effects of an open-circuit, a closed-circuit and a short-circuit on a basic d.c. single path relationship between voltage and current from measured values in a simple circuit
- determining voltage, current and resistance in a circuit given any two of these quantities
- graphical relationships of voltage, current and resistance
- relationship between voltage, current and resistance

T4 Electrical power encompassing:

- relationship between force, power, work and energy
- power dissipated in circuit from voltage, current and resistance values
- power ratings of devices
- measurement electrical power in a d.c. circuit
- effects of power rating of various resistors

T5 Effects of electrical current encompassing:

- physiological effects of current and the fundamental principles (listed in AS/NZS 3000) for protection against the this effect
- basic principles by which electric current can result in the production of heat; the production of magnetic fields; a chemical reaction
- typical uses of the effects of current
- mechanisms by which metals corrode
- fundamental principles (listed in AS/NZS3000) for protection against the damaging effects of current

T6 EMF sources energy sources and conversion electrical energy encompassing:

- basic principles of producing a emf from the interaction of a moving conductor in a magnetic field.
- basic principles of producing an emf from the heating of one junction of a thermocouple.
- basic principles of producing a emf by the application of sun light falling on the surface of photovoltaic cells
- basic principles of generating a emf when a mechanical force is applied to a crystal (piezo electric effect)
- principles of producing a electrical current from primary, secondary and fuel cells

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REQUIRED SKILLS AND KNOWLEDGE

- input, output, efficiency or losses of electrical systems and machines
- effect of losses in electrical wiring and machines
- principle of conservation of energy

T7 Resistors encompassing:

- features of fixed and variable resistor types and typical applications
- identification of fixed and variable resistors
- various types of fixed resistors used in the Electro technology Industry. e.g. wire-wound, carbon film, tapped resistors.
- various types of variable resistors used in the Electro technology Industry e.g. adjustable resistors: potentiometer and rheostat; light dependent resistor (LDR); voltage dependent resistor (VDR) and temperature dependent resistor (NTC, PTC).
- characteristics of temperature, voltage and light dependent resistors and typical applications of each
- power ratings of a resistor.
- power loss (heat) occurring in a conductor.
- resistance of a colour coded resistor from colour code tables and confirm the value by measurement.
- measurement of resistance of a range of variable' resistors under varying conditions of light, voltage, temperature conditions.
- specifying a resistor for a particular application.

T8 Series circuits encompassing:

- circuit diagram of a single-source d.c. 'series' circuit.
- Identification of the major components of a 'series' circuit: power supply; loads; connecting leads and switch
- applications where 'series' circuits are used in the Electro technology industry.
- characteristics of a 'series' circuit - connection of loads, current path, voltage drops, power dissipation and affects of an open circuit in a 'series' circuit.
- the voltage, current, resistances or power dissipated from measured or given values of any two of these quantities
- relationship between voltage drops and resistance in a simple voltage divider network.
- setting up and connecting a single-source series dc circuit
- measurement of resistance, voltage and current values in a single source series circuit
- effect of an open-circuit on a series connected circuit

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Evidence Guide

EVIDENCE GUIDE

9) The evidence guide provides advice on assessment and must be read in conjunction with the Performance Criteria, Required Skills and Knowledge, the Range Statement and the Assessment Guidelines for this Training Package.

The Evidence Guide forms an integral part of this unit. It must be used in conjunction with all parts of the unit and performed in accordance with the Assessment Guidelines of this Training Package.

Overview of Assessment **9.1)**

Longitudinal competency development approaches to assessment, such as Profiling, require data to be reliably gathered in a form that can be consistently interpreted over time. This approach is best utilised in Apprenticeship programs and reduces assessment intervention. It is the industry-preferred model for apprenticeships. However, where summative (or final) assessment is used it is to include the application of the competency in the normal work environment or, at a minimum, the application of the competency in a realistically simulated work environment. It is recognised that, in some circumstances, assessment in part or full can occur outside the workplace. However, it must be in accordance with industry and regulatory policy.

Methods chosen for a particular assessment will be influenced by various factors. These include the extent of the assessment, the most effective locations for the assessment activities to take place, access to physical resources, additional safety measures that may be required and the critical nature of the competencies being assessed.

The critical safety nature of working with electricity, electrical equipment, gas or any other hazardous substance/material carries risk in deeming a person competent. Sources of evidence need to be ‘rich’ in nature to minimise error in judgment.

Activities associated with normal everyday work have a bearing on the decision as to how much and how detailed the data gathered will contribute to its ‘richness’. Some skills are more critical to safety and operational requirements while the same skills may be more or less frequently practised. These points are raised for the assessors to consider when choosing an assessment method and developing assessment instruments. Sample assessment instruments are included for Assessors in the Assessment Guidelines of this Training Package.

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Critical aspects of evidence required to demonstrate competency in this unit **9.2)**

Before the critical aspects of evidence are considered all prerequisites must be met.

Evidence for competence in this unit shall be considered holistically. Each element and associated performance criteria shall be demonstrated on at least two occasions in accordance with the 'Assessment Guidelines – UEE11'. Evidence shall also comprise:

- A representative body of work performance demonstrated within the timeframes typically expected of the discipline, work function and industrial environment. In particular this shall incorporate evidence that shows a candidate is able to:
  - Implement Occupational Health and Safety workplace procedures and practices, including the use of risk control measures as specified in the performance criteria and range statement
  - Apply sustainable energy principles and practices as specified in the performance criteria and range statement
  - Demonstrate an understanding of the essential knowledge and associated skills as described in this unit. It may be required by some jurisdictions that RTOs provide a percentile graded result for the purpose of regulatory or licensing requirements.
  - Demonstrate an appropriate level of skills enabling employment
  - Conduct work observing the relevant Anti Discrimination legislation, regulations, polices and workplace procedures
- Demonstrated consistent performance across a representative range of contexts from the prescribed items below:
  - Solve problems in extra-low voltage single path circuits as described in 8) and including:

A Determining the operating parameters of an existing circuit.

B Altering an existing circuit to comply with specified operating parameters.

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C	Developing circuits to comply with a specified function and operating parameters.
D	Identifying loss of supply.
E	Dealing with unplanned events by drawing on essential knowledge and skills to provide appropriate solutions incorporated in a holistic assessment with the above listed items.

Context of and specific resources for assessment

9.3)

This unit should be assessed as it relates to normal work practice using procedures, information and resources typical of a workplace. This should include:

- OHS policy and work procedures and instructions.
- Suitable work environment, facilities, equipment and materials to undertake actual work as prescribed in this unit.

These should be used in the formal learning/assessment environment.

Note:

Where simulation is considered a suitable strategy for assessment, conditions for assessment must be authentic and as far as possible reproduce and replicate the workplace and be consistent with the approved industry simulation policy.

The resources used for assessment should reflect current industry practices in relation to solve problems in extra-low voltage single path circuits.

Method of assessment

9.4)

This unit shall be assessed by methods given in Volume 1, Part 3 ‘Assessment Guidelines’.

Note:

Competent performance with inherent safe working practices is expected in the Industry to which this unit applies. This requires that the specified essential knowledge and associated skills are assessed in a structured environment which is primarily intended

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for learning/assessment and incorporates all necessary equipment and facilities for learners to develop and demonstrate the essential knowledge and skills described in this unit.

Concurrent assessment and relationship with other units

9.5)

There are no concurrent assessment recommendations for this unit.

The critical aspects of occupational health and safety covered in unit UEENEEE101A and other discipline specific occupational health and safety units shall be incorporated in relation to this unit.

Range Statement

RANGE STATEMENT

10) This relates to the unit as a whole providing the range of contexts and conditions to which the performance criteria apply. It allows for different work environments and situations that will affect performance.

This unit shall be demonstrated in relation to:

- Single source single path circuits as they apply to problems related to installation, fault finding, maintenance or development work functions in any of the following disciplines:
  - Computers
  - Data Communications
  - Electrical
  - Electronics
  - Fire protection
  - Instrumentation
  - Refrigeration and Air Conditioning,
  - Renewable and sustainable energy systems, and
  - Security technology
- In relation to at least three of the following types of circuit problems and on at least two occasions:
  - Determining the operating parameters of an existing circuit
  - Identifying and locating open-circuits
  - Identifying and locating short-circuits

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RANGE STATEMENT

- Identifying loss of supply

Generic terms used throughout this Vocational Standard shall be regarded as part of the Range Statement in which competency is demonstrated. The definition of these and other terms that apply are given in Volume 2, Part 2.1.

Unit Sector(s)

Not applicable.

Competency Field

Competency Field **11)**

Electrotechnology

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UEENEEE104A Solve problems in d.c. circuits

Modification History

Not Applicable

Unit Descriptor

Unit Descriptor **1**)

1.1) Descriptor

This unit covers determining correct operation of single source d.c. series, parallel and series-parallel circuits and providing solutions as they apply to various electrotechnology work functions. It encompasses working safely, problem solving procedures, including the use of voltage, current and resistance measuring devices, providing solutions derived from measurements and calculations to predictable problems in single and multiple path circuits.

Application of the Unit

Not Applicable

Licensing/Regulatory Information

1.2) License to practice

During Training: Competency development activities are subject to regulations directly related to licencing, occupational health and safety and where applicable contracts of training such as apprenticeships.

In the workplace: The application of the skills and knowledge described in this unit require a license to practice in the workplace where work is carried out on electrical equipment or installations which are designed to operate at voltages greater than 50 V a.c. or 120 V d.c.

Other conditions may apply under State and Territory legislative and regulatory requirements.

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Pre-Requisites

Prerequisite Unit(s) **2)**

2.1) Competencies

Granting competency in this unit shall be made only after competency in the following unit(s) has/have been confirmed.

UEENEEE101A	Apply Occupational Health and Safety regulations, codes and practices in the workplace

Employability Skills Information

Employability Skills **3)**

This unit contains Employability Skills

The required outcomes described in this unit of competency contain applicable facets of Employability Skills. The Employability Skills Summary of the qualification in which this unit of competency is packaged will assist in identifying Employability Skill requirements.

Application of the Unit **4)**

4.1) General Application

This unit applies to competency development entry-level employment based programs incorporated in approved contracts of training.

4.2) Importation

RTOs wishing to import this unit into any qualification under the flexibility provisions of NQC Training Package Policy

Elements and Performance Criteria Pre-Content

6) Elements describe

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the essential outcomes
of a unit of competency

Elements and Performance Criteria

ELEMENT	PERFORMANCE CRITERIA
1 Prepare to work on d.c. electrical circuits.	1.1 OHS procedures for a given work area are identified, obtained and understood.
	1.2 OHS risk control work preparation measures and procedures are followed.
	1.3 The nature of the circuit problem is obtained from documentation or from work supervisor to establish the scope of work to be undertaken.
	1.4 Advice is sought from the work supervisor to ensure the work is coordinated effectively with others.
	1.5 Sources of materials that may be required for the work are identified and accessed in accordance with established procedures.
	1.6 Tools, equipment and testing devices needed to carry out the work are obtained and checked for correct operation and safety.
2 Solve d.c. circuit problems.	2.1 OHS risk control work measures and procedures are followed.
	2.2 The need to test or measure live is determined in strict accordance with OHS requirements and when necessary conducted within established safety procedures.
	2.3 Circuits are checked as being isolated where necessary in strict accordance OHS requirements and procedures.
	2.4 Established methodological techniques are used to solve d.c. circuit problems from measure and calculated values as they apply to electrical circuit.
	2.5 Unexpected situations are dealt with safely and with the approval of an authorised person.

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ELEMENT	PERFORMANCE CRITERIA	
	2.6	Problems are solved without damage to apparatus, circuits, the surrounding environment or services and using sustainable energy practices.
3 Complete work and document problem solving activities.	3.1	OHS work completion risk control measures and procedures are followed.
	3.2	Work site is cleaned and made safe in accordance with established procedures.
	3.3	Justification for solutions used to solve circuit problems is documented.
	3.4	Work completion is documented and appropriate person(s) notified in accordance with established procedures.

Required Skills and Knowledge

REQUIRED SKILLS AND KNOWLEDGE

7) This describes the essential skills and knowledge and their level, required for this unit.

Evidence shall show that knowledge has been acquired of safe working practices and solving problems in d.c. circuits.

The knowledge and skills shall be contextualised to current industry standards, technologies and practices.

KS01-EE104A Direct current circuits

Evidence shall show an understanding of electrical fundamentals and direct current multiple path circuits to an extent indicated by the following aspects:

T1 Basic electrical concepts encompassing:

- electrotechnology industry
- static and current electricity
- production of electricity by renewable and non renewable energy sources
- transportation of electricity from the source to the load via the transmission and distribution systems
- utilisation of electricity by the various loads
- basic calculations involving quantity of electricity, velocity and speed with relationship to the generation and transportation of electricity.

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REQUIRED SKILLS AND KNOWLEDGE

T2 Basic electrical circuit encompassing:

- symbols used to represent an electrical energy source, a load, a switch and a circuit protection device in a circuit diagram
- purpose of each component in the circuit
- effects of an open-circuit, a closed-circuit and a short-circuit
- multiple and sub-multiple units

T3 Ohm's Law encompassing:

- basic d.c. single path circuit.
- voltage and currents levels in a basic d.c. single path circuit.
- effects of an open-circuit, a closed-circuit and a short-circuit on a basic d.c. single path relationship between voltage and current from measured values in a simple circuit
- determining voltage, current and resistance in a circuit given any two of these quantities
- graphical relationships of voltage, current and resistance
- relationship between voltage, current and resistance

T4 Electrical power encompassing:

- relationship between force, power, work and energy
- power dissipated in circuit from voltage, current and resistance values
- power ratings of devices
- measurement electrical power in a d.c. circuit
- effects of power rating of various resistors

T5 Effects of electrical current encompassing:

- physiological effects of current and the fundamental principles (listed in AS/NZS 3000) for protection against the this effect
- basic principles by which electric current can result in the production of heat; the production of magnetic fields; a chemical reaction
- typical uses of the effects of current
- mechanisms by which metals corrode
- fundamental principles (listed in AS/NZS3000) for protection against the damaging effects of current

T6 EMF sources energy sources and conversion electrical energy encompassing:

- basic principles of producing a emf from the interaction of a moving conductor in a magnetic field.
- basic principles of producing an emf from the heating of one junction of a thermocouple.
- basic principles of producing a emf by the application of sun light falling on the surface of photovoltaic cells
- basic principles of generating a emf when a mechanical force is applied to a crystal

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REQUIRED SKILLS AND KNOWLEDGE

(piezo electric effect)

- principles of producing a electrical current from primary, secondary and fuel cells
- input, output, efficiency or losses of electrical systems and machines
- effect of losses in electrical wiring and machines
- principle of conservation of energy

T7 Resistors encompassing:

- features of fixed and variable resistor types and typical applications
- identification of fixed and variable resistors
- various types of fixed resistors used in the Electro technology Industry. e.g. wire-wound, carbon film, tapped resistors.
- various types of variable resistors used in the Electro technology Industry e.g. adjustable resistors: potentiometer and rheostat; light dependent resistor (LDR); voltage dependent resistor (VDR) and temperature dependent resistor (NTC, PTC).
- characteristics of temperature, voltage and light dependent resistors and typical applications of each
- power ratings of a resistor.
- power loss (heat) occurring in a conductor.
- resistance of a colour coded resistor from colour code tables and confirm the value by measurement.
- measurement of resistance of a range of variable' resistors under varying conditions of light, voltage, temperature conditions.
- specifying a resistor for a particular application.

T8 Series circuits encompassing:

- circuit diagram of a single-source d.c. 'series' circuit.
- Identification of the major components of a 'series' circuit: power supply; loads; connecting leads and switch
- applications where 'series' circuits are used in the Electro technology industry.
- characteristics of a 'series' circuit - connection of loads, current path, voltage drops, power dissipation and affects of an open circuit in a 'series' circuit.
- the voltage, current, resistances or power dissipated from measured or given values of any two of these quantities
- relationship between voltage drops and resistance in a simple voltage divider network.
- setting up and connecting a single-source series dc circuit
- measurement of resistance, voltage and current values in a single source series circuit
- effect of an open-circuit on a series connected circuit

T9 Parallel circuits encompassing:

- schematic diagram of a single-source d.c. 'parallel' circuit.
- major components of a 'parallel' circuit (power supply, loads, connecting leads and

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REQUIRED SKILLS AND KNOWLEDGE

switch)
- applications where ‘parallel’ circuits are used in the Electrotechnology industry.
- characteristics of a ‘parallel’ circuit. (load connection, current paths, voltage drops, power dissipation, affects of an open circuit in a ‘parallel’ circuit).
- relationship between currents entering a junction and currents leaving a junction
- relationship between branch currents and resistances in a two branch current divider network.
- calculation of the total resistance of a ‘parallel’ circuit.
- calculation of the total current of a ‘parallel’ circuit.
- Calculation of the total voltage and the individual voltage drops of a ‘parallel’ circuit.
- setting up and connecting a single-source d.c. parallel circuit
- resistance, voltage and current measurements in a single-source parallel circuit
- voltage, current, resistance or power dissipated from measured values of any of these quantities
- output current and voltage levels of connecting cells in parallel.

T10 Series/parallel circuits encompassing:

- schematic diagram of a single-source d.c. ‘series/parallel’ circuit.
- major components of a ‘series/parallel’ circuit (power supply, loads, connecting leads and switch)
- applications where ‘series/parallel’ circuits are used in the Electrotechnology industry.
- characteristics of a ‘series/parallel’ circuit. (load connection, current paths, voltage drops, power dissipation, affects of an open circuit in a ‘series/parallel’ circuit).
- relationship between voltages, currents and resistances in a bridge network.
- calculation of the total resistance of a ‘series/parallel’ circuit.
- calculation of the total current of a ‘series/parallel’ circuit.
- calculation of the total voltage and the individual voltage drops of a ‘series/parallel’ circuit.
- setting up and connecting a single-source d.c. series/ parallel circuit
- resistance, voltage and current measurements in a single-source d.c. series / parallel circuit
- the voltage, current, resistances or power dissipated from measured values of any two of these quantities

T11 Factors affecting resistance encompassing:

- four factors that affect the resistance of a conductor (type of material, length, cross-sectional area and temperature)
- affect the change in the type of material (resistivity) has on the resistance of a conductor.
- affect the change in ‘length’ has on the resistance of a conductor.
- affect the change in ‘cross-sectional area’ has on the resistance of a conductor.

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REQUIRED SKILLS AND KNOWLEDGE

- effects of temperature change on the resistance of various conducting materials
- effects of resistance on the current-carrying capacity and voltage drop in cables.
- calculation of the resistance of a conductor from factors such as conductor length, cross-sectional area, resistivity and changes in temperature
- using digital and analogue ohmmeter to measure the change in resistance of different types of conductive materials (copper, aluminium, nichrome, tungsten) when those materials undergo a change in type of material length, cross-sectional area and temperature.

T12 Effects of meters in a circuit encompassing:

- selecting an appropriate meter in terms of units to be measured, range, loading effect and accuracy for a given application.
- measuring resistance using direct, volt-ammeter and bridge methods.
- instruments used in the field to measure voltage, current, resistance and insulation resistance and the typical circumstances in which they are used.
- hazards involved in using electrical instruments and the safety control measures that should be taken.
- operating characteristics of analogue and digital meters.
- correct techniques to read the scale of an analogue meters and how to reduce the ‘parallax’ error.
- types of voltmeters used in the Electrotechnology industry – bench type, clamp meter, Multimeter, etc.
- purpose and characteristics (internal resistance, range, loading effect and accuracy) of a voltmeter.
- types of voltage indicator testers. e.g. LED, neon, solenoid, volt-stick, series tester, etc. and explain the purpose of each voltage indicator tester.
- operation of various voltage indicator testers.
- advantages and disadvantages of each voltage indicator tester.
- various types of ammeters used in the Electrotechnology industry – bench, clamp meter, multimeter, etc.
- purpose of an ammeter and the correct connection (series) of an ammeter into a circuit.
- reasons why the internal resistance of an ammeter must be extremely low and the dangers and consequences of connecting an ammeter in parallel and/or wrong polarity.
- selecting an appropriate meter in terms of units to be measured, range, loading effect and accuracy for a given application
- connecting an analogue/digital voltmeter into a circuit ensuring the polarities are correct and take various voltage readings.
- loading effect of various voltmeters when measuring voltage across various loads.
- using voltage indicator testers to detect the presence of various voltage levels.
- connecting analogue/digital ammeter into a circuit ensuring the polarities are correct and take various current readings.

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REQUIRED SKILLS AND KNOWLEDGE

T13 Resistance measurement encompassing:

- Identification of instruments used in the field to measure resistance (including insulation resistance) and the typical circumstances in which they are used.
- the purpose of an Insulation Resistance (IR) Tester.
- the parts and functions of various analogue and digital IR Tester (selector range switch, zero ohms adjustment, battery check function, scale and connecting leads).
- reasons why the supply must be isolated prior to using the IR tester.
- where and why the continuity test would be used in an electrical installation.
- where and why the insulation resistance test would be used in an electrical installation.
- the voltage ranges of an IR tester and where each range may be used. e.g. 250 V d.c, 500 V d.c and 1000 V d.c
- AS/NZS3000 Wiring Rules requirements – continuity test and insulation resistance (IR) test.
- purpose of regular IR tester calibration.
- the correct methods of storing the IR tester after use
- carry out a calibration check on a IR Tester
- measurement of low values of resistance using an IR tester continuity functions.
- measurement of high values of resistance using an IR tester insulation resistance function.
- volt-ammeter (short shunt and long shunt) methods of measuring resistance.
- calculation of resistance values using voltmeter and ammeter reading (long and short shunt connections)
- measurement of resistance using volt-ammeter methods

T14 Capacitors and Capacitance encompassing:

- basic construction of standard capacitor, highlighting the: plates, dielectric and connecting leads
- different types of dielectric material and each dielectric's relative permittivity.
- identification of various types of capacitors commonly used in the Electrotechnology industry (fixed value capacitors -stacked plate, rolled, electrolytic, ceramic, mica and Variable value capacitors – tuning and trimmer)
- circuit symbol of various types of capacitors: standard; variable, trimmer and polarised
- terms: Capacitance (C), Electric charge (Q) and Energy (W)
- unit of: Capacitance (Farad), Electric charge (Coulomb) and Energy (Joule)
- factors affecting capacitance (the effective area of the plates, the distance between the plates and the type of dielectric) and explain how these factors are present in all circuits to some extent.
- how a capacitor is charged in a d.c. circuit.
- behaviour of a series d.c. circuit containing resistance and capacitance components. - charge and discharge curves

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REQUIRED SKILLS AND KNOWLEDGE

- the term ‘Time Constant’ and its relationship to the charging and discharging of a capacitor.
- calculation of quantities from given information: Capacitance (Q = VC); Energy (W =½CV2); Voltage (V = Q/C)
- calculation one time constant as well as the time taken to fully charge and discharge a given capacitor. ($\tau = RC$)
- connection of a series d.c. circuit containing capacitance and resistor to determine the time constant of the circuit

T15 Capacitors in Series and Parallel encompassing:

- hazards involved in working with capacitance effects and the safety control measures that should be taken.
- safe handling and the correct methods of discharging various size capacitors
- dangers of a charged capacitor and the consequences of discharging a capacitor through a person
- factors which determine the capacitance of a capacitor and explain how these factors are present in all circuits to some extent.
- effects of capacitors connected in parallel by calculating their equivalent capacitance.
- effects on the total capacitance of capacitors connected in series by calculating their equivalent capacitance.
- Connecting capacitors in series and/or parallel configurations to achieve various capacitance values.
- common faults in capacitors.
- testing of capacitors to determine serviceability.
- application of capacitors in the Electrotechnology industry.

Evidence Guide

EVIDENCE GUIDE

9) The evidence guide provides advice on assessment and must be read in conjunction with the Performance Criteria, Required Skills and Knowledge, the Range Statement and the Assessment Guidelines for this Training Package.

The Evidence Guide forms an integral part of this unit. It must be used in conjunction with all parts of the unit and performed in accordance with the Assessment Guidelines of this Training Package.

Overview of Assessment	**9.1**) Longitudinal competency development approaches to assessment, such as Profiling, require data to be reliably gathered in a form

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EVIDENCE GUIDE

that can be consistently interpreted over time. This approach is best utilised in Apprenticeship programs and reduces assessment intervention. It is the industry-preferred model for apprenticeships. However, where summative (or final) assessment is used it is to include the application of the competency in the normal work environment or, at a minimum, the application of the competency in a realistically simulated work environment. It is recognised that, in some circumstances, assessment in part or full can occur outside the workplace. However, it must be in accordance with industry and regulatory policy.

Methods chosen for a particular assessment will be influenced by various factors. These include the extent of the assessment, the most effective locations for the assessment activities to take place, access to physical resources, additional safety measures that may be required and the critical nature of the competencies being assessed.

The critical safety nature of working with electricity, electrical equipment, gas or any other hazardous substance/material carries risk in deeming a person competent. Sources of evidence need to be 'rich' in nature to minimise error in judgment.

Activities associated with normal everyday work have a bearing on the decision as to how much and how detailed the data gathered will contribute to its 'richness'. Some skills are more critical to safety and operational requirements while the same skills may be more or less frequently practised. These points are raised for the assessors to consider when choosing an assessment method and developing assessment instruments. Sample assessment instruments are included for Assessors in the Assessment Guidelines of this Training Package.

Critical aspects of evidence required to demonstrate competency in this unit

9.2)

Before the critical aspects of evidence are considered all prerequisites must be met.

Evidence for competence in this unit shall be considered holistically. Each element and associated performance criteria shall be demonstrated on at least two occasions in accordance with the 'Assessment Guidelines - UEE07'. Evidence shall also comprise:

- A representative body of work performance demonstrated within the timeframes typically expected of the discipline, work function and industrial environment. In particular this shall incorporate evidence that shows a candidate is able to:

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EVIDENCE GUIDE

- Implement Occupational Health and Safety workplace procedures and practices, including the use of risk control measures as specified in the performance criteria and range statement
- Apply sustainable energy principles and practices as specified in the performance criteria and range statement
- Demonstrate an understanding of the essential knowledge and associated skills as described in this unit. It may be required by some jurisdictions that RTOs provide a percentile graded result for the purpose of regulatory or licensing requirements.
- Demonstrate an appropriate level of skills enabling employment
- Conduct work observing the relevant Anti Discrimination legislation, regulations, polices and workplace procedures

- Demonstrated consistent performance across a representative range of contexts from the prescribed items below:
  - Solving problems in d.c. circuits as described in 8) and including:

    A Using methodological techniques to solve d.c. circuit problems from measure and calculated values

    B Determining the operating parameters of an existing circuit.

    C Altering an existing circuit to comply with specified operating parameters.

    D Developing circuits to comply with a specified function and operating parameters.

    E Dealing with unplanned events

Context of and specific resources for assessment

9.3)

This unit should be assessed as it relates to normal work practice using procedures, information and resources typical of a workplace. This should include:

- OHS policy and work procedures and instructions.
- Suitable work environment, facilities, equipment and materials to undertake actual work as prescribed in this unit.

These should be used in the formal learning/assessment environment.

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EVIDENCE GUIDE

Note:

Where simulation is considered a suitable strategy for assessment, conditions for assessment must be authentic and as far as possible reproduce and replicate the workplace and be consistent with the approved industry simulation policy.

The resources used for assessment should reflect current industry practices in relation to solving problems in d.c. circuits.

Method of assessment

9.4)

This unit shall be assessed by methods given in Volume 1, Part 3 'Assessment Guidelines'.

Note:
Competent performance with inherent safe working practices is expected in the Industry to which this unit applies. This requires that the specified essential knowledge and associated skills are assessed in a structured environment which is primarily intended for learning/assessment and incorporates all necessary equipment and facilities for learners to develop and demonstrate the essential knowledge and skills described in this unit.

Concurrent assessment and relationship with other units

9.5)

There are no concurrent assessment recommendations for this unit.

Range Statement

RANGE STATEMENT

8) This relates to the unit as a whole providing the range of contexts and conditions to which the performance criteria apply. It allows for different work environments and situations that will affect performance.

This unit shall be demonstrated in relation to single source series, parallel and series-parallel d.c. circuits as they apply to problems related to installation, fault finding, maintenance or development work functions and at least two of the following types of circuit problems and on more than one occasions:

- Determining the operating parameters of an existing circuit
- Altering an existing circuit to comply with specified operating parameters
- Developing circuits to comply with a specified function and operating parameters

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RANGE STATEMENT

Generic terms used throughout this Vocational Standard shall be regarded as part of the Range Statement in which competency is demonstrated. The definition of these and other terms that apply are given in Volume 2, Part 2.1.

Unit Sector(s)

Not Applicable

Competency Field

2.2) Literacy and numeracy skills

Participants are best equipped to achieve competency in this unit if they have reading, writing and numeracy skills indicated by the following scales. Description of each scale is given in Volume 2, Part 3 'Literacy and Numeracy'

Reading	3	Writing	3	Numeracy	3

2.2) Literacy and numeracy skills

Competency Field **5)**

Electrotechnology

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UEENEEE105A Fix and secure electrotechnology equipment

Modification History

Not Applicable

Unit Descriptor

Unit Descriptor **1**)

1.1) Descriptor

This unit covers fixing, securing and mounting techniques as apply in the various electrotechnology work functions. It encompasses the safe use of hand and portable power tools, safe lifting techniques, safe use of ladders and elevated platforms and the selection and safe application of fixing devices and supporting accessories/equipment.

Application of the Unit

Not Applicable

Licensing/Regulatory Information

1.2) License to practice

During Training: Competency development activities are subject to regulations directly related to licencing, occupational health and safety and where applicable contracts of training such as apprenticeships.

In the workplace: The application of the skills and knowledge described in this unit require a license to practice in the workplace where work is carried out on electrical equipment or installations which are designed to operate at voltages greater than 50 V a.c. or 120 V d.c.

Other conditions may apply under State and Territory legislative and regulatory requirements.

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Pre-Requisites

Prerequisite Unit(s) **2)**

2.1) Competencies

Granting competency in this unit shall be made only after competency in the following unit(s) has/have been confirmed.

UEENEEE101A	Apply Occupational Health and Safety regulations, codes and practices in the workplace

Employability Skills Information

Employability Skills **3)**

This unit contains Employability Skills

The required outcomes described in this unit of competency contain applicable facets of Employability Skills. The Employability Skills Summary of the qualification in which this unit of competency is packaged will assist in identifying Employability Skill requirements.

Application of the Unit **4)**

4.1) General Application

This unit applies to all qualifications, competencies and/or Skill Sets which require an electrical licence.

4.2) Importation

RTOs wishing to import this unit into any qualification under the flexibility provisions of NQC Training Package Policy

Elements and Performance Criteria Pre-Content

6) Elements describe
the essential outcomes

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of a unit of competency

Elements and Performance Criteria

ELEMENT	PERFORMANCE CRITERIA	
1 Prepare to fix and secure equipment.	1.1	OHS procedures for a given work area are identified, obtained and understood.
	1.2	OHS risk control work preparation measures and procedures are followed.
	1.3	The scope of work to be undertaken is obtained from documentation or from work supervisor.
	1.4	Advice is sought from the work supervisor to ensure the work is coordinated effectively with others.
	1.5	Sources of materials that may be required for the work are identified and accessed in accordance with established procedures.
	1.6	Fixing devices are selected for their suitable ability for the environment, the load they are to support and substratum's into which they are to be installed.
	1.7	Supporting accessories/equipment is selected for suitability for the environment and ability to support and protect from damage that which they are intended to support.
	1.8	Tools, equipment and testing devices needed to carry out the work are obtained and checked for correct operation and safety.
2 Install fixing and support devices.	2.1	Electrical isolation is arranged where work is within arm's reach of exposed conductive parts, plant or machinery in strict accordance OHS requirements and procedures.
	2.2	Other OHS risk control measures relevant to the work site are followed.
	2.3	Fixing devices are installed in accordance with manufacturer instructions.
	2.4	Support accessories/equipment is install accurately

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ELEMENT	PERFORMANCE CRITERIA	
		and to comply with technical standards and job specifications.
	2.5	Work is carried out efficiently without waste of materials or damage to apparatus, circuits, the surrounding environment or services and using sustainable energy principles.
3 Complete fixing and support work.	3.1	OHS risk control work completion measures and procedures are followed.
	3.2	Work site is tidied and tools and equipment cleaned and securely stored.
	3.3	Appropriate personnel are notified of the work completion.

Required Skills and Knowledge

REQUIRED SKILLS AND KNOWLEDGE

7) This describes the essential skills and knowledge and their level, required for this unit.

Evidence shall show that knowledge has been acquired of safe working practices and fixing and securing equipment.

The knowledge and skills shall be contextualised to current industry standards, technologies and practices.

KS01-EE105A Fixing and support devices/techniques

Evidence shall show an understanding of accessories and support and fixing device and methods and their use to an extent indicated by the following aspects:

T1. Device for securing and mounting electrical/electronic/instrumentation/refrigeration/ air-conditioning/telecommunications accessories for supporting, fixing and protecting wiring/cabling/piping and functional accessories to hollow walls encompassing:

- types and safe application of devices for hollow wall fixing and support
- methods/techniques used to fix/support to wood, hollow wall, masonry blocks, plasterboard, panelling
- types and safe application of fixing devices used in the electrotechnology industry for wood and hollow wall structures (wood screws, coach bolts, self-tappers, self drilling, metal thread, hollow wall anchors, behind plaster brackets, stud brackets,

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REQUIRED SKILLS AND KNOWLEDGE

plasterboard devices, toggle devices)
- types of tools used for hollow wall fixing and supporting.
- using various fixing methods to fix/support to hollow walls.

T2. Device for securing and mounting electrical/electronic/instrumentation/refrigeration/ air-conditioning/telecommunications accessories for supporting, fixing and protecting wiring/cabling/piping and functional accessories to solid walls encompassing:

- types and safe application of devices used for solid wall fixing and support
- methods/techniques used in to fix to masonry and concrete structures
- fixing devices used in the electrotechnology industry for solid wall structures (wall-plugs, expanding concrete fixing devices, gas powered fixing tools, powder actuated fixing tools, loxins, dynabolts, chemical devices)
- regulatory requirements for use of powder fixing tools.
- hand and power tools used in fixing and supporting accessories
- using various fixing methods to fix/support to solid walls

T3. Device for securing and mounting electrical/electronic/instrumentation/refrigeration/ air-conditioning/telecommunications accessories for supporting, fixing and protecting wiring/cabling/piping and functional accessories to metal fixing encompassing:

- accessories that may be fixed to metal (saddle clips, conduits, brackets, switches)
- techniques for fixing to metal
- fixing devices: coach bolts, self-tappers, metal thread bolts, hollow wall anchors, rivets
- fixing tools - spanners, screwdrivers, power screw drivers, pop riveters, files, reamers
- OH&S issues related to drilling, cutting, eye protection, metal filings, swarf, noise
- Using power drills, drill bits, change drill speeds.
- Install a fixing device and accessory capable of supporting up to 20 kg on the metal plate.

T4. Securing and mounting electrical/electronic/instrumentation/refrigeration/ air-conditioning/telecommunications accessories for supporting, fixing and protecting wiring/cabling/piping and functional accessories using fixing adhesives and tapes encompassing:

- types and safe application of using adhesives and tapes as fixing devices (load limits of different commercial products)
- accessories that may be fixed using adhesives and tapes
- techniques for the application of adhesives and tapes
- tools used to apply and cut adhesives and tapes
- hazards and safety measures when working with adhesives and chemical fixing devices (fumes, cutting, eye protection, physical contact, hand protection, ingestion)

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Evidence Guide

EVIDENCE GUIDE

9) The evidence guide provides advice on assessment and must be read in conjunction with the Performance Criteria, Required Skills and Knowledge, the Range Statement and the Assessment Guidelines for this Training Package.

The Evidence Guide forms an integral part of this unit. It must be used in conjunction with all parts of the unit and performed in accordance with the Assessment Guidelines of this Training Package.

Overview of Assessment

9.1)

Longitudinal competency development approaches to assessment, such as Profiling, require data to be reliably gathered in a form that can be consistently interpreted over time. This approach is best utilised in Apprenticeship programs and reduces assessment intervention. It is the industry-preferred model for apprenticeships. However, where summative (or final) assessment is used it is to include the application of the competency in the normal work environment or, at a minimum, the application of the competency in a realistically simulated work environment. It is recognised that, in some circumstances, assessment in part or full can occur outside the workplace. However, it must be in accordance with industry and regulatory policy.

Methods chosen for a particular assessment will be influenced by various factors. These include the extent of the assessment, the most effective locations for the assessment activities to take place, access to physical resources, additional safety measures that may be required and the critical nature of the competencies being assessed.

The critical safety nature of working with electricity, electrical equipment, gas or any other hazardous substance/material carries risk in deeming a person competent. Sources of evidence need to be 'rich' in nature to minimise error in judgment.

Activities associated with normal everyday work have a bearing on the decision as to how much and how detailed the data gathered will contribute to its 'richness'. Some skills are more critical to safety and operational requirements while the same skills may be more or less frequently practised. These points are raised for the assessors to consider when choosing an assessment method and developing assessment instruments. Sample assessment instruments are included for Assessors in the

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EVIDENCE GUIDE

Assessment Guidelines of this Training Package.

Critical aspects of evidence required to demonstrate competency in this unit

9.2)

Before the critical aspects of evidence are considered all prerequisites must be met.

Evidence for competence in this unit shall be considered holistically. Each element and associated performance criteria shall be demonstrated on at least two occasions in accordance with the 'Assessment Guidelines - UEE07'. Evidence shall also comprise:

- A representative body of work performance demonstrated within the timeframes typically expected of the discipline, work function and industrial environment. In particular this shall incorporate evidence that shows a candidate is able to:
  - Implement Occupational Health and Safety workplace procedures and practices, including the use of risk control measures as specified in the performance criteria and range statement
  - Apply sustainable energy principles and practices as specified in the performance criteria and range statement
  - Demonstrate an understanding of the essential knowledge and associated skills as described in this unit. It may be required by some jurisdictions that RTOs provide a percentile graded result for the purpose of regulatory or licensing requirements.
  - Demonstrate an appropriate level of skills enabling employment
  - Conduct work observing the relevant Anti Discrimination legislation, regulations, polices and workplace procedures
- Demonstrated consistent performance across a representative range of contexts from the prescribed items below:
  - Fix and secure electrical equipment as described in 8) and including:

    A Selecting fixing for loads of < 5 kg, < 20 kg and < 50 kg and suitable for the environment in which they are to be installed.

    B Installing fixing devices in compliance with manufacturers instructions

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EVIDENCE GUIDE

C Installing appropriate devices for fixing to a hollow wall, brick, concrete and steel.

D Installing fixing support accessories/equipment relevant the discipline in which competency is sought.

E Dealing with unplanned events

Context of and specific resources for assessment

9.3)

This unit should be assessed as it relates to normal work practice using procedures, information and resources typical of a workplace. This should include:

- OHS policy and work procedures and instructions.
- Suitable work environment, facilities, equipment and materials to undertake actual work as prescribed in this unit.

These should be used in the formal learning/assessment environment.

Note:

Where simulation is considered a suitable strategy for assessment, conditions for assessment must be authentic and as far as possible reproduce and replicate the workplace and be consistent with the approved industry simulation policy.

The resources used for assessment should reflect current industry practices in relation to fixing and securing electrical equipment.

Method of assessment

9.4)

This unit shall be assessed by methods given in Volume 1, Part 3 'Assessment Guidelines'.

Note:
Competent performance with inherent safe working practices is expected in the Industry to which this unit applies. This requires that the specified essential knowledge and associated skills are assessed in a structured environment which is primarily intended for learning/assessment and incorporates all necessary equipment and facilities for learners to develop and demonstrate the essential knowledge and skills described in this unit.

Concurrent assessment and relationship with other units

9.5)

For optimisation of training and assessment effort, competency development in this unit may be arranged concurrently with

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units covering other installation competencies.

Range Statement

RANGE STATEMENT

8) This relates to the unit as a whole providing the range of contexts and conditions to which the performance criteria apply. It allows for different work environments and situations that will affect performance.

This unit shall be demonstrated in relation to installation, fault finding, maintenance or development work functions in any of the following disciplines:

- Appliances
- Business equipment
- Computers
- Data Communications
- Electrical
- Electrical Machines
- Electronics
- Fire protection
- Instrumentation
- Refrigeration and Air Conditioning
- Renewable / sustainable energy, and
- Security technology

Generic terms used throughout this Vocational Standard shall be regarded as part of the Range Statement in which competency is demonstrated. The definition of these and other terms that apply are given in Volume 2, Part 2.1.

Unit Sector(s)

Not Applicable

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Competency Field

2.2) Literacy and numeracy skills

Participants are best equipped to achieve competency in this unit if they have reading, writing and numeracy skills indicated by the following scales. Description of each scale is given in Volume 2, Part 3 'Literacy and Numeracy'

Reading	3	Writing	3	Numeracy	3

2.2) Literacy and numeracy skills

Competency Field **5)**

Electrotechnology

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UEENEEE107A Use drawings, diagrams, schedules, standards, codes and specifications

Modification History

Not Applicable

Unit Descriptor

Unit Descriptor **1**)

1.1) **Descriptor**

This unit covers the use of drawings, diagrams, cable schedules, standards, codes and specifications as they apply to the various electrotechnology work functions. It encompasses the rudiments for communicating with schematic, wiring and mechanical diagrams and equipment and cable/connection schedules, manuals, site and architectural drawings and plans showing the location of services, apparatus, plant and machinery and understanding the use and format of compliance standards and job specifications.

Application of the Unit

Not Applicable

Licensing/Regulatory Information

1.2) **License to practice**

During Training: Competency development activities are subject to regulations directly related to licencing, occupational health and safety and where applicable contracts of training such as apprenticeships.

In the workplace: The application of the skills and knowledge described in this unit require a license to practice in the workplace where work is carried out on electrical equipment or installations which are designed to operate at voltages greater than 50 V a.c. or 120 V d.c.

Other conditions may apply under State and Territory legislative and regulatory requirements.

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Pre-Requisites

Prerequisite Unit(s) **2)**

2.1) Competencies

Granting competency in this unit shall be made only after competency in the following unit(s) has/have been confirmed.

UEENEEE101A	Apply Occupational Health and Safety regulations, codes and practices in the workplace

Employability Skills Information

Employability Skills **3)**

This unit contains Employability Skills

The required outcomes described in this unit of competency contain applicable facets of Employability Skills. The Employability Skills Summary of the qualification in which this unit of competency is packaged will assist in identifying Employability Skill requirements.

Application of the Unit **4)**

4.1) General Application

This unit applies to competency development entry-level employment based programs incorporated in approved contracts of training.

4.2) Importation

RTOs wishing to import this unit into any qualification under the flexibility provisions of NQC Training Package Policy

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Elements and Performance Criteria Pre-Content

6) Elements describe the essential outcomes of a unit of competency

Elements and Performance Criteria

ELEMENT		PERFORMANCE CRITERIA	
1	Prepare to use drawings, diagrams, schedules and manuals.	1.1	Established OHS risk control measures and procedures are followed.
		1.2	The need for drawings, diagrams, schedules or manuals is determined from the nature of the work to be undertaken.
		1.3	Established routines and procedures are followed to obtain drawings, diagrams, schedules or manuals required for the work to be undertaken.
2	Use drawings, diagrams, schedules and manuals to obtain job information.	2.1	Drawings, diagrams, schedules and/or manuals are selected, appropriate to the work being undertaken.
		2.2	Drawings, diagrams and schedules are interpreted using knowledge of drawing layouts, conventions and symbols.
		2.3	Dimensions are extracted from drawings and diagrams for application to work undertaken.
		2.4	Location of equipment is determined from equipment schedules and location diagrams.
		2.5	Manuals are reviewed to ascertain their format and where information relevant to the work to be undertaken is located.
		2.6	Information given in manuals is interpreted in relation to the work to be undertaken.
3	Use drawings, diagrams, schedules and manuals to	3.1	Drawing conventions are used in neat freehand drawings to convey information and ideas to others involved in the work to be undertaken.

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ELEMENT	PERFORMANCE CRITERIA	
convey information and ideas.	3.2	Drawing conventions are used to neatly correct freehand original job drawing to show final 'as-installed' arrangement.
	3.3	Corrected drawings are forwarded to appropriate person(s) in accordance with established procedures.
4 Prepare to use compliance standards, codes and specifications.	4.1	Compliance Standards and Codes that apply to particular disciplines are sought and obtained.
	4.2	The format of compliance Standards and Codes that apply to particular disciplines are reviewed and understood.
	4.3	The purpose and format and typical content of job specifications are reviewed and understood.

Required Skills and Knowledge

REQUIRED SKILLS AND KNOWLEDGE

7) This describes the essential skills and knowledge and their level, required for this unit.

Evidence shall show that knowledge has been acquired of safe working practices and using drawings, diagrams, cable schedules, standards, codes and specifications.

The knowledge and skills shall be contextualised to current industry standards, technologies and practices.

KS01-EE107A Drawings, diagrams and schedules

Evidence shall show an understanding of drawings, diagrams and schedules used in electrotechnology work to an extent indicated by the following aspects:

T1 Architectural drawings encompassing:

- site plans, floor plans detailed drawings and standard drawings
- architectural floor plan to determine the power and lighting or communications / audio/ video layouts required in a domestic installation
- site plan to locate the service point, consumers mains, communication services, main switchboard, distribution boards and/or builders supplies.
- standard drawing scales to determine the actual lengths represented by dimensions on an architectural drawing.
- reading and interpretation of floor plans to determine the location of the electrical/

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REQUIRED SKILLS AND KNOWLEDGE

communication/audio accessories and appliances.

- Australian standard symbols used on floor plans to show the location of the accessories and appliances as detailed in an electrical schedule.

T2 Electrical drawings encompassing:

- types of electrical drawings: block, circuit, wiring and ladder diagrams
- purpose and application of block, circuit, wiring diagrams and ladder diagrams
- Australian standard symbols used to represent components on electrical diagrams.
- conventions used in and the features of circuit diagrams
- converting a circuit diagram to a wiring diagram
- identification of cable type, origin and route from a cable schedule.
- developing a cable schedule for a given installation.

T3 Circuit diagrams encompassing:

- purpose of circuit diagrams in the electrotechnology industry
- conventions used in and the features of circuit diagrams
- sketching basic circuit diagrams
- common symbols used in circuit diagram (Australian Drawing Standard AS/NZS 1102)
- developing switching charts to identify the terminals of various types of switches
- connecting equipment using circuit diagrams.

T4 Wiring diagrams encompassing:

- purpose of wiring diagrams in the electrotechnology industry
- conventions used in and the features of wiring diagrams
- sketching basic wiring diagrams
- common symbols used in wiring diagram (Australian Drawing Standard AS/NZS 1102)
- connecting equipment using wiring diagrams.

T5 Building construction drawings and diagrams encompassing:

- building types: timber frame, brick veneer, double brick and metal frame.
- identification of different types of: footings, floors, external walls, roofs, interior walls
- typical cable routes through buildings, structures and premises
- sequence of each constructional stage for brick, brick veneer and timber cottages
- identification of the stages at which the electrical/communications - first and second fixing occurs in the constructional sequence
- areas of cooperation between electrical/communications and other building trades

KS02-EE107A Introduction to regulations, compliance standards and codes

Evidence shall show an understanding of regulations, compliance standards and codes that apply to electrical work to an extent indicated by the following aspects:

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REQUIRED SKILLS AND KNOWLEDGE

T1 Regulation for undertaking electrical work encompassing:

- scope of work covered by licensing in the electrotechnology industry (Electrical licensing)
- legislative requirements for ensuring electrical or electronic equipment is safe i.e. compliance requirements of electrical installations

T2 Standards philosophy and format encompassing:

- performance verses prescriptive requirements
- purpose of technical standards and their development
- role of standards Australia/New Zealand, International Organisation for Standardisation (ISO) and the International Electrotechnical Commission (IEC)
- how standards are used in compulsory and accreditation compliance schemes.
- arrangement and use of technical standards in relation to electrical and electronic work
- how to read and apply a standard.
- Standards and codes that apply to all types of electrical installations
- Standards include Standards mandated under regulation (e.g. Wiring Rules) or by an authority, deemed-to-comply standard and local service requirements (e.g. Service rules).
- Codes include those applicable to electrical safe working practices and some aspects of the Building Code of Australia.

T3 Purpose, format and content of typical job specifications encompassing:

- NATSPEC specification system - provide the most common templates on which job specification are written.

Evidence Guide

EVIDENCE GUIDE

9) The evidence guide provides advice on assessment and must be read in conjunction with the Performance Criteria, Required Skills and Knowledge, the Range Statement and the Assessment Guidelines for this Training Package.

The Evidence Guide forms an integral part of this unit. It must be used in conjunction with all parts of the unit and performed in accordance with the Assessment Guidelines of this Training Package.

Overview of Assessment	**9.1**) Longitudinal competency development approaches to assessment, such as Profiling, require data to be reliably gathered in a form that can be consistently interpreted over time. This approach is best utilised in Apprenticeship programs and reduces assessment

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intervention. It is the industry-preferred model for apprenticeships. However, where summative (or final) assessment is used it is to include the application of the competency in the normal work environment or, at a minimum, the application of the competency in a realistically simulated work environment. It is recognised that, in some circumstances, assessment in part or full can occur outside the workplace. However, it must be in accordance with industry and regulatory policy.

Methods chosen for a particular assessment will be influenced by various factors. These include the extent of the assessment, the most effective locations for the assessment activities to take place, access to physical resources, additional safety measures that may be required and the critical nature of the competencies being assessed.

The critical safety nature of working with electricity, electrical equipment, gas or any other hazardous substance/material carries risk in deeming a person competent. Sources of evidence need to be 'rich' in nature to minimise error in judgment.

Activities associated with normal everyday work have a bearing on the decision as to how much and how detailed the data gathered will contribute to its 'richness'. Some skills are more critical to safety and operational requirements while the same skills may be more or less frequently practised. These points are raised for the assessors to consider when choosing an assessment method and developing assessment instruments. Sample assessment instruments are included for Assessors in the Assessment Guidelines of this Training Package.

Critical aspects of evidence required to demonstrate competency in this unit

9.2)

Before the critical aspects of evidence are considered all prerequisites must be met.

Evidence for competence in this unit shall be considered holistically. Each element and associated performance criteria shall be demonstrated on at least two occasions in accordance with the 'Assessment Guidelines - UEE07'. Evidence shall also comprise:

- A representative body of work performance demonstrated within the timeframes typically expected of the discipline, work function and industrial environment. In particular this shall incorporate evidence that shows a candidate is able to:
  - Implement Occupational Health and Safety workplace procedures and practices, including the use of risk control measures as specified in the performance criteria and range statement
  - Apply sustainable energy principles and practices as

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specified in the performance criteria and range statement

- Demonstrate an understanding of the essential knowledge and associated skills as described in this unit. It may be required by some jurisdictions that RTOs provide a percentile graded result for the purpose of regulatory or licensing requirements.
- Demonstrate an appropriate level of skills enabling employment
- Conduct work observing the relevant Anti Discrimination legislation, regulations, polices and workplace procedures

- Demonstrated consistent performance across a representative range of contexts from the prescribed items below:
  - Use drawings, diagrams, schedules, standards, codes and specifications as described in 8) Range and including:

    A Identifying drawings, diagrams, schedules and manuals relevant to the work to be undertaken.

    B Interpreting drawings, diagrams, schedules and manuals correctly.

    C Using correct conventions in freehand drawings.

    D Giving correct information in freehand drawings.

    E Obtaining compliance Standards and Codes applicable to particular disciplines

    F Reviewing and understanding the format of compliance Standards and Codes that apply to particular disciplines

    G Reviewing the format and content of typical job specifications.

    H Dealing with unplanned events

Context of and specific resources for assessment

9.3)

This unit should be assessed as it relates to normal work practice using procedures, information and resources typical of a workplace. This should include:

- OHS policy and work procedures and instructions.
- Suitable work environment, facilities, equipment and materials to undertake actual work as prescribed in this unit.

These should be used in the formal learning/assessment

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environment.

Note:

Where simulation is considered a suitable strategy for assessment, conditions for assessment must be authentic and as far as possible reproduce and replicate the workplace and be consistent with the approved industry simulation policy.

The resources used for assessment should reflect current industry practices in relation to using drawings, diagrams, schedules and manuals.

Method of assessment

9.4)

This unit shall be assessed by methods given in Volume 1, Part 3 'Assessment Guidelines'.

Note:
Competent performance with inherent safe working practices is expected in the Industry to which this unit applies. This requires that the specified essential knowledge and associated skills are assessed in a structured environment which is primarily intended for learning/assessment and incorporates all necessary equipment and facilities for learners to develop and demonstrate the essential knowledge and skills described in this unit.

Concurrent assessment and relationship with other units

9.5)

For optimisation of training and assessment effort, competency development in this unit may be arranged concurrently with units covering the use of drawings, diagrams, schedules, standards, codes or specifications is required.

Range Statement

RANGE STATEMENT

8) This relates to the unit as a whole providing the range of contexts and conditions to which the performance criteria apply. It allows for different work environments and situations that will affect performance.

This unit shall be demonstrated in relation to assembly, installation, fault finding, maintenance or development work functions in any of the following disciplines:

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RANGE STATEMENT

- Appliances
- Business equipment
- Computers
- Data Communications
- Electrical
- Electrical Machines
- Electronics
- Fire protection
- Instrumentation
- Refrigeration and Air Conditioning
- Renewable / sustainable energy, and
- Security technology

Generic terms used throughout this Vocational Standard shall be regarded as part of the Range Statement in which competency is demonstrated. The definition of these and other terms that apply are given in Volume 2, Part 2.1.

Unit Sector(s)

Not Applicable

Competency Field

2.2) Literacy and numeracy skills

Participants are best equipped to achieve competency in this unit if they have reading, writing and numeracy skills indicated by the following scales. Description of each scale is given in Volume 2, Part 3 'Literacy and Numeracy'

Reading	3	Writing	3	Numeracy	3

Custom Content Section

Competency Field **5)**

Electrotechnology

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UEENEEE108A Lay wiring/cabling and terminate accessories for extra-low voltage (ELV) circuits

Modification History

Not applicable.

Unit Descriptor

Unit Descriptor **1) Scope:**

1.1) Descriptor

This unit covers the laying of wiring/cabling, connection of accessories and continuity and insulation resistance testing of circuits intended to operate at extra-low voltage. Typically this includes circuits and accessories for ELV powered devices, security, controls, integrated systems, audio/video systems. It encompasses the principles of single source, single load power circuits, control circuits and communications circuits, safe working practices and following work processes that satisfy electrical principles for safety and functionality.

Application of the Unit

Application of the Unit **2)**

This unit is intended for competency development in entry-level employment based programs incorporated in approved contracts of training.

Licensing/Regulatory Information

License to practice **3)**

The skills and knowledge described in this unit do not require a license to practice in the workplace. However, practice in this unit is subject to regulations directly related to occupational health and safety and where

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License to practice **3)**

applicable contracts of training such as apprenticeships.

Note:

1. Compliance with permits may be required in various jurisdictions and typically relates to the operation of plant, machinery and equipment such as elevating work platforms, powder operated fixing tools, and power operated tools, vehicles, road signage and traffic control, lifting equipment. Permits may also be required for some work environments such as confined spaces, working aloft, near live electrical apparatus and site rehabilitation.

Pre-Requisites

Prerequisite Unit(s) **4)**

Competencies **4.1)**

Granting competency in this unit shall be made only after competency in the following unit(s) has/have been confirmed.

UEENEEE101A	Apply Occupational Health and Safety regulations, codes and practices in the workplace
UEENEEE102A	Fabricate, dismantle, assemble of utilities industry components
UEENEEE105A	Fix and secure electrotechnology equipment
UEENEEE107A	Use drawings, diagrams, schedules, standards, codes and specifications

Literacy and numeracy skills **4.2)**

Participants are best equipped to achieve competency in this unit if they have reading, writing and numeracy skills indicated by the following scales. Description of each scale is given in Volume 2, Part 3 ‘Literacy and

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Numeracy'

Reading 3 Writing 3 Numeracy 3

Employability Skills Information

Employability Skills **5)**

This unit contains Employability Skills

The required outcomes described in this unit of competency contain applicable facets of Employability Skills. The Employability Skills Summary of the qualification in which this unit of competency is packaged will assist in identifying Employability Skill requirements.

Elements and Performance Criteria Pre-Content

6) Elements describe the essential outcomes of a competency standard unit

Performance Criteria describe the required performance needed to demonstrate achievement of the element. Assessment of performance is to be consistent with the Evidence Guide.

Elements and Performance Criteria

ELEMENT	PERFORMANCE CRITERIA
1 Prepare to lay wiring/cabling and connect accessories for extra-low voltage circuits.	1.1 OHS procedures for a given work area are obtained and understood through established routines.
	1.2 Established OHS risk control measures in preparation for the work are followed.
	1.3 Safety hazards not previously identified are reported and advice on risk control measures is sought from the work supervisor.
	1.4 The nature and location of the work is obtained from work supervisor or other appropriate person to establish the scope of work to be

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ELEMENT	PERFORMANCE CRITERIA	
		undertaken.
	1.5	Advice is sought from the work supervisor or other appropriate person to ensure the work is coordinated effectively with others.
	1.6	Sources of materials that may be required for the work are established in accordance with established routines.
	1.7	Tools, equipment and testing devices needed to carry out the work are obtained and checked for correct operation and safety.
2 Lay wiring/cabling and connect accessories for extra-low voltage circuits.	2.1	Established OHS risk control measures for carrying out the work are followed.
	2.2	Circuits/machines/plant are checked as being isolated where necessary in strict accordance OHS requirements and procedures.
	2.3	Wiring and accessories are installed to comply standards and job specifications with sufficient excess to affect terminations.
	2.4	Accessories are installed straight and square in the required locations and within acceptable tolerances.
	2.5	Cables and conductors are terminated at accessories in accordance with manufacture’s specifications and regulatory requirements.
	2.6	Cables installed for future service and marked in accordance with the cable identification scheme and terminated incompliance with regulatory requirements.
	2.7	Procedures for referring non-routine events to immediate supervisor for directions are followed.
	2.8	Cable installation and termination is carried out efficiently without waste of materials or damage to apparatus, circuits or the surrounding environment and using sustainable energy practices.

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ELEMENT	PERFORMANCE CRITERIA	
3 Complete and report work activities.	3.1	OHS work completion risk control measures and procedures are followed.
	3.2	Work site is cleaned and made safe in accordance with established procedures.
	3.3	Work supervisor is notified of the completion of the installation work in accordance with established routines.

Required Skills and Knowledge

EQUIRED SKILLS AND KNOWLEDGE

8) This describes the essential skills and knowledge and their level, required for this unit.

Evidence shall show that knowledge has been acquired of safe working practices and laying wiring/cabling and terminate accessories for extra-low voltage circuits.

All knowledge and skills detailed in this unit should be contextualised to current industry practices and technologies.

KS01-EE108A Extra low voltage wiring

Evidence shall show an understanding of extra low voltage wiring cable protection and support method and accessories to an extent indicated by the following aspects:

T1 Cable protection and support method and accessories encompassing:

- Requirements to protect and support cables adequately - protection against mechanical damage, protection from adverse temperatures and corrosion and protection from magnetic field that may affect the performance of the cable.
- Cable support and protection devices, accessories and typical applications - metallic and non-metallic conduits, duct and trunking, cable ladder and tray, cable clips and ties and related accessories.
- Installation techniques - cable installation equipment and cable drawing and hauling techniques

T2 Types of cables used in the electrotechnology industry and their application encompassing:

- Structural components of cables and their purpose - conductors and conductor material; insulation; sheathings and servings.
- Application of various cables types
- Cable variates - single cables, flexible cables, flexible cords, shielded cables, armoured cables, ribbon cables, other similar and like cables

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EQUIRED SKILLS AND KNOWLEDGE

- Typical characteristics and use of power circuit cables and control circuit cables

T3 Installing cables in buildings, structures and premises encompassing:

- Building construction method and construction sequence.
- Typical cable routes through buildings, structures and premises.
- Building codes affecting the installation of cables in buildings, structures and premises - limitation on penetration structural elements and maintenance of fire protection interiority
- Cable segregation requirements

T4 Basic cable and conductor terminations encompassing:

- Insulation removal and replacement
- Conductor handling and cable terminations encompassing:
  - General aspects and soldering involving pins on electronic components and stranded conductors carrying current up to 25 amperes.
  - Application of connecting devices for conductors and terminals
  - Continuity through connections and insulation resistance testing
  - Stress release on cables/conductors.

T5 Technical standards, regulations and codes related to extra-low voltage work encompassing:

- Limitation imposed by regulations
- How to read and apply a standard
- Aspects of technical Standards that apply to extra-low voltage work

T6 Environmental and heritage regulation effecting electrotechnology work encompassing:

- Purpose of environmental and heritage regulation
- Typical issues affecting electrotechnology services and systems
- Meeting requirements

Evidence Guide

EVIDENCE GUIDE

9) The evidence guide provides advice on assessment and must be read in conjunction with the Performance Criteria, Required Skills and Knowledge, the Range Statement and the Assessment Guidelines for this Training Package.

The Evidence Guide forms an integral part of this unit. It must be used in conjunction with all parts of the unit and performed in accordance with the Assessment Guidelines of this Training Package.

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Overview of Assessment **9.1)**

Longitudinal competency development approaches to assessment, such as Profiling, require data to be reliably gathered in a form that can be consistently interpreted over time. This approach is best utilised in Apprenticeship programs and reduces assessment intervention. It is the industry-preferred model for apprenticeships. However, where summative (or final) assessment is used it is to include the application of the competency in the normal work environment or, at a minimum, the application of the competency in a realistically simulated work environment. It is recognised that, in some circumstances, assessment in part or full can occur outside the workplace. However, it must be in accordance with industry and regulatory policy.

Methods chosen for a particular assessment will be influenced by various factors. These include the extent of the assessment, the most effective locations for the assessment activities to take place, access to physical resources, additional safety measures that may be required and the critical nature of the competencies being assessed.

The critical safety nature of working with electricity, electrical equipment, gas or any other hazardous substance/material carries risk in deeming a person competent. Sources of evidence need to be ‘rich’ in nature to minimise error in judgment.

Activities associated with normal everyday work have a bearing on the decision as to how much and how detailed the data gathered will contribute to its ‘richness’. Some skills are more critical to safety and operational requirements while the same skills may be more or less frequently practised. These points are raised for the assessors to consider when choosing an assessment method and developing assessment instruments. Sample assessment instruments are included for Assessors in the Assessment Guidelines of this Training Package.

Critical aspects of evidence required to demonstrate competency in this unit **9.2)**

Before the critical aspects of evidence are considered all

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prerequisites must be met.

Evidence for competence in this unit shall be considered holistically. Each element and associated performance criteria shall be demonstrated on at least two occasions in accordance with the 'Assessment Guidelines – UEE11'. Evidence shall also comprise:

- A representative body of work performance demonstrated within the timeframes typically expected of the discipline, work function and industrial environment. In particular this shall incorporate evidence that shows a candidate is able to:
  - Implement Occupational Health and Safety workplace procedures and practices, including the use of risk control measures as specified in the performance criteria and range statement
  - Apply sustainable energy principles and practices as specified in the performance criteria and range statement
  - Demonstrate an understanding of the essential knowledge and associated skills as described in this unit. It may be required by some jurisdictions that RTOs provide a percentile graded result for the purpose of regulatory or licensing requirements.
  - Demonstrate an appropriate level of skills enabling employment
  - Conduct work observing the relevant Anti Discrimination legislation, regulations, polices and workplace procedures
- Demonstrated consistent performance across a representative range of contexts from the prescribed items below:
  - Lay wiring/cabling and terminate accessories for extra-low voltage in power and control circuits as described in 8) and including:

A	Understanding the nature of the work.
B	Selecting appropriate tools, cables and accessories.
C	Following appropriate cable routes.
D	Installing cable and accessories to requirements.
E	Terminating cables and accessories to manufacture's specifications and requirements.
F	Cleaning worksite.
G	Notifying completion of work using established procedures.

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Context of and specific resources for assessment

9.3)

This unit should be assessed as it relates to normal work practice using procedures, information and resources typical of a workplace. This should include:

- OHS policy and work procedures and instructions.
- Suitable work environment, facilities, equipment and materials to undertake actual work as prescribed in this unit.

These should be used in the formal learning/assessment environment.

Note:

Where simulation is considered a suitable strategy for assessment, conditions for assessment must be authentic and as far as possible reproduce and replicate the workplace and be consistent with the approved industry simulation policy.

The resources used for assessment should reflect current industry practices in relation to laying wiring/cabling and terminate accessories for extra-low voltage circuits.

Method of assessment

9.4)

This unit shall be assessed by methods given in Volume 1, Part 3 ‘Assessment Guidelines’.

Note:

Competent performance with inherent safe working practices is expected in the Industry to which this unit applies. This requires that the specified essential knowledge and associated skills are assessed in a structured environment which is primarily intended for learning/assessment and incorporates all necessary equipment and facilities for learners to develop and demonstrate the essential knowledge and skills described in this unit.

Concurrent assessment and relationship with

9.5)

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other units

For optimisation of training and assessment effort, competency development in this unit may be arranged concurrently with unit:

UEENEEE102A	Fabricate, dismantle, assemble of utilities industry components
UEENEEE105A	Fix and secure electrotechnology equipment
UEENEEE107A	Use drawings, diagrams, schedules, standards, codes and specifications

Range Statement

RANGE STATEMENT

10) This relates to the unit as a whole providing the range of contexts and conditions to which the performance criteria apply. It allows for different work environments and situations that will affect performance.

This unit shall be demonstrated in relation to laying wiring/cabling and connecting accessories for extra-low voltage power and control cabling systems circuits using:

- At least one of the following wiring/cabling systems:
  - Unenclosed thermoplastic sheathed (TPS) cable
  - Enclosed thermoplastic insulated (TPI) or sheathed cables, and
- At least three of the following wiring/cabling systems:
  - single cable,
  - flexible cable,
  - flexible cord,
  - shielded cable,
  - ribbon cable,
  - other similar and like cable

Generic terms used throughout this Vocational Standard shall be regarded as part of the Range Statement in which competency is demonstrated. The definition of these and other terms that apply are given in Volume 2, Part 2.1.

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Unit Sector(s)

Not applicable.

Competency Field

Competency Field **11)**

Electrotechnology

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UEENEEE117A Implement and monitor energy sector OHS policies and procedures

Modification History

Not applicable.

Unit Descriptor

Unit Descriptor **1) Scope:**

1.1) Descriptor

This unit covers the mandatory requirements of persons in a supervisory role to implement and monitor an organisation's occupational health and safety policies, procedures and programs. It encompasses understanding an organisation's OHS obligations, providing safety information to staff, implementing and monitoring participative arrangements, safety procedures and training and maintaining safety records.

Application of the Unit

Application of the Unit **2)**

This unit addresses information, processes and techniques for the application of general occupational health and safety requirements in workplaces and is essential for employees work supervisory responsibilities. The unit is based on Generic Competency A in the National Guidelines for Integrating OHS Competencies into National Industry Competency Standards [NOHSC: 7025 (1998) 2nd Edition].

Note:
All States/Territories and the Commonwealth have enacted legislation that establishes a general duty of care for workplace parties to ensure healthy and safe working conditions. In most workplaces, the final responsibility for providing a healthy and safe working environment, as far as practicable, rests with the employer. Employees also have a duty of care in relation to OHS that ensures their health and safety and that of others in the

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workplace. The relevant jurisdictional OHS legislation should always be consulted to ascertain the exact duties set down for employers and employees.

Licensing/Regulatory Information

License to practice **3)**

The competency described in this unit does not directly require a license to practice but is subject to regulations for occupational health and safe and contracts of training where they apply.

Pre-Requisites

Prerequisite Unit(s) **4)**

Competencies **4.1)**

There are no prerequisite competencies for this unit.

Literacy and numeracy skills **4.2)**

Participants are best equipped to achieve competency in this unit if they have reading, writing and numeracy skills indicated by the following scales. Description of each scale is given in Volume 2, Part 3 ‘Literacy and Numeracy’

Reading 5 Writing 5 Numeracy 5

Employability Skills Information

Employability Skills **5)**

This unit contains Employability Skills

The required outcomes described in this unit of competency contain applicable facets of Employability

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Employability Skills	**5)** Skills. The Employability Skills Summary of the qualification in which this unit of competency is packaged will assist in identifying Employability Skill requirements.

Elements and Performance Criteria Pre-Content

6) Elements describe the essential outcomes of a competency standard unit	Performance Criteria describe the required performance needed to demonstrate achievement of the element. Assessment of performance is to be consistent with the Evidence Guide.

Elements and Performance Criteria

ELEMENT	PERFORMANCE CRITERIA
1 Provide OHS information to the work group.	1.1 Relevant provisions of occupational health and safety legislation and codes of practice are accurately and clearly explained to the work group.
	1.2 Information on the organisation's occupational health and safety policies, procedures and programs is provided in a readily accessible manner and is accurately and clearly explained to the work group.
	1.3. Information about identified hazards and the outcomes of risk assessment and risk control procedures is regularly provided and is accurately and clearly explained to the work group.
2 Implement and monitor participative arrangements for the management of OHS.	2.1 Organisational procedures for consultation over occupational health and safety issues are implemented and monitored to ensure that all members of the work group have the opportunity to contribute.
	2.2 Issues raised through consultation are dealt with and resolved promptly or referred to the appropriate personnel for resolution in accordance with workplace procedures for issue

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ELEMENT	PERFORMANCE CRITERIA	
		resolution.
	2.3	The outcomes of consultation over occupational health and safety issues are made known to the work group promptly.
3. Implement and monitor the procedures for identifying hazards, assessing risk and controlling risks.	3.1	Existing and potential hazards in the work area are identified and reported so that risk assessment and risk control procedures can be applied.
	3.2	Work procedures to control risks are implemented and adherence to them by the work group is monitored in accordance with workplace procedures.
	3.3	Existing procedures to control risks are implemented and adherence to them by the work group is monitored in accordance with workplace procedures.
	3.4	Inadequacies in existing risk control measures are identified in accordance with the hierarchy of control and reported to designated personnel.
	3.5	Inadequacies in resource allocation for implementation of risk control measures identified and reported to designated personnel.
4 Implement the procedures for dealing with hazardous events.	4.1	Workplace procedures for dealing with hazardous events are implemented whenever necessary to ensure that prompt control action is taken.
	4.2	Hazardous events are investigated to identify their cause in accordance with investigation procedures.
	4.3	Control measures to prevent recurrence and minimise risks of hazardous events are implemented based on the hierarchy of control if within scope of responsibilities and competencies or alternatively referred to designated personnel for implementation.

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ELEMENT	PERFORMANCE CRITERIA
5 Implement and monitor the procedures for OHS training.	5.1 Occupational health and safety training needs are identified accurately, specifying gaps between occupational health and safety competencies required and those held by work group members.
	5.2 Arrangements are made for fulfilling identified occupational health and safety training needs in both on and off-the-job training programs in consultation with relevant parties.
6 Implement and monitor the procedures for maintaining OHS records.	6.1 Occupational health and safety records for work area are accurately and legibly completed in accordance with workplace requirements for occupational health and safety records and legal requirements for the maintenance of records of occupational injury and disease.
	6.2 Aggregate information from the area's occupational health and safety records is used to identify hazards and monitor risk control procedures within work according to organisational procedures and within scope of responsibilities and competencies.

Required Skills and Knowledge

REQUIRED SKILLS AND KNOWLEDGE

8) This describes the essential skills and knowledge and their level, required for this unit.

Evidence shall show that knowledge has been acquired of safe working practices and implementing and monitoring energy sector OHS policies and procedures

All knowledge and skills detailed in this unit should be contextualised to current industry practices and technologies.

KS01-EE117A Energy sector Occupational Health and Safety, supervisory responsibilities

Evidence shall show an understanding of OHS enterprise responsibilities to an extent indicated by the following aspects:

T1 Provisions of relevant occupational health and safety legislation

T2 Principles and practice of effective occupational health and safety management

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REQUIRED SKILLS AND KNOWLEDGE

T3 Workplace hazards, range and selection of control measures

T4 Organisational health and safety management systems and policies and procedures needed for legislative compliance

T5 Impact of characteristics and composition of the workforce on occupational health and safety management

T6 Relevance of occupational health and safety management to other organisational management policies, procedures and systems.

T7 Analysis of entire work environment and judge occupational health and safety interventions

T8 Analysis of relevant workplace data

T9 Ability to assess resources needed for risk control.

Evidence Guide

EVIDENCE GUIDE

9) The evidence guide provides advice on assessment and must be read in conjunction with the Performance Criteria, Required Skills and Knowledge, the Range Statement and the Assessment Guidelines for this Training Package.

The Evidence Guide forms an integral part of this unit. It must be used in conjunction with all parts of the unit and performed in accordance with the Assessment Guidelines of this Training Package.

Overview of Assessment **9.1)**

Longitudinal competency development approaches to assessment, such as Profiling, require data to be reliably gathered in a form that can be consistently interpreted over time. This approach is best utilised in Apprenticeship programs and reduces assessment intervention. It is the industry-preferred model for apprenticeships. However, where summative (or final) assessment is used it is to include the application of the competency in the normal work environment or, at a minimum, the application of the competency in a realistically simulated work environment. It is recognised that, in some circumstances, assessment in part or full can occur outside the workplace. However, it must be in accordance with industry and regulatory policy.

Methods chosen for a particular assessment will be influenced by

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various factors. These include the extent of the assessment, the most effective locations for the assessment activities to take place, access to physical resources, additional safety measures that may be required and the critical nature of the competencies being assessed.

The critical safety nature of working with electricity, electrical equipment, gas or any other hazardous substance/material carries risk in deeming a person competent. Sources of evidence need to be 'rich' in nature to minimise error in judgment.

Activities associated with normal everyday work have a bearing on the decision as to how much and how detailed the data gathered will contribute to its 'richness'. Some skills are more critical to safety and operational requirements while the same skills may be more or less frequently practised. These points are raised for the assessors to consider when choosing an assessment method and developing assessment instruments. Sample assessment instruments are included for Assessors in the Assessment Guidelines of this Training Package.

Critical aspects of evidence required to demonstrate competency in this unit

9.2)

Before the critical aspects of evidence are considered all prerequisites must be met.

Evidence for competence in this unit shall be considered holistically. Each element and associated performance criteria shall be demonstrated on at least two occasions in accordance with the 'Assessment Guidelines – UEE11'. Evidence shall also comprise:

- A representative body of work performance demonstrated within the timeframes typically expected of the discipline, work function and industrial environment. In particular this shall incorporate evidence that shows a candidate is able to:
  - Implement Occupational Health and Safety workplace procedures and practices, including the use of risk control measures as specified in the performance criteria and range statement
  - Apply sustainable energy principles and practices as specified in the performance criteria and range statement
  - Demonstrate an understanding of the essential knowledge

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and associated skills as described in this unit. It may be required by some jurisdictions that RTOs provide a percentile graded result for the purpose of regulatory or licensing requirements.

- Demonstrate an appropriate level of skills enabling employment
- Conduct work observing the relevant Anti Discrimination legislation, regulations, polices and workplace procedures

- Demonstrated consistent performance across a representative range of contexts from the prescribed items below:
  - Implement and monitor energy sector OHS policies and procedures as described in 8) and including:

A Providing OHS information to the work group.

B Implementing and monitoring participative arrangements for the management of OHS.

C Implementing and monitoring the procedures for identifying procedures for identifying hazards, assessing risks and controlling risks.

D Implementing the procedures for dealing with hazardous events.

E Implementing and monitoring the procedures for OHS.

F Implementing and monitoring the procedures for maintaining OHS records.

G Dealing with unplanned events by drawing on essential knowledge and skills to provide appropriate solutions incorporated in a holistic assessment with the above listed items.

Context of and specific resources for assessment

9.3)

This unit should be assessed as it relates to normal work practice using procedures, information and resources typical of a workplace. This should include:

- OHS policy and work procedures and instructions.
- Suitable work environment, facilities, equipment and materials

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to undertake actual work as prescribed in this unit.

These should be used in the formal learning/assessment environment.

Note:

Where simulation is considered a suitable strategy for assessment, conditions for assessment must be authentic and as far as possible reproduce and replicate the workplace and be consistent with the approved industry simulation policy.

The resources used for assessment should reflect current industry practices in relation to implementing and monitoring energy sector OHS policies and procedures.

Method of assessment **9.4)**

This unit shall be assessed by methods given in Volume 1, Part 3 'Assessment Guidelines'.

Note:

Competent performance with inherent safe working practices is expected in the Industry to which this unit applies. This requires that the specified essential knowledge and associated skills are assessed in a structured environment which is primarily intended for learning/assessment and incorporates all necessary equipment and facilities for learners to develop and demonstrate the essential knowledge and skills described in this unit.

Concurrent assessment and relationship with other units **9.5)**

For optimisation of training and assessment effort, competence in this unit may be assessed concurrently with other related units making up a qualification or possible skill clusters.

Components of this unit are included in the critical aspects of evidence of all units to help ensure the appropriate level of responsibility for safety has been acquired.

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Range Statement

RANGE STATEMENT

10) This relates to the unit as a whole providing the range of contexts and conditions to which the performance criteria apply. It allows for different work environments and situations that will affect performance.

This unit shall be demonstrated in relation to implementing and monitoring energy sector OHS policies and procedures with the following attributes:

- organisation's OHS obligations
- safety information to staff
- participative arrangements implementation and monitoring
- safety procedures
- training
- safety records maintained

Implementing and monitoring the mandatory requirements of persons in a supervisory role an organisation's occupational health and safety policies, procedures and programs shall be demonstrated in the following:

- Relevant Occupational Health and Safety legislation, regulations and codes of practice related to hazards present in the industry and particular workplace
- Implementation of OHS and the specific safety procedures and work instructions for particular workplace

Generic terms used throughout this Vocational Standard shall be regarded as part of the Range Statement in which competency is demonstrated. The definition of these and other terms that apply are given in Volume 2, Part 2.1.

Unit Sector(s)

Not applicable.

Competency Field

Competency Field **11)**

Electrotechnology

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UEENEEE119A Solve problems in multiple path extra low voltage (ELV) a.c. circuits

Modification History

Release	Action	Core/Elective	Details	Points
2	Edit		Correct title of pre-requisite to reflect unit title.	

Unit Descriptor

Unit Descriptor

1) Scope:

1.1) Descriptor

This unit covers determining correct operation of single source ELV a.c. parallel and series-parallel circuits and providing solutions as they apply to various electrotechnology work functions. It encompasses working safely, problem solving procedures, including the use of voltage, current and resistance measuring devices, providing solutions derived from measurements and calculations to predictable problems in multiple path circuits.

Application of the Unit

Application of the Unit

2)

This competency standard is suitable for employment-based programs under an approved contract of training at the AQF level of the qualification in which the unit is first packaged or higher.

The unit may be selected as an elective from the relevant schedule (see qualification packaging rules) provided that all prerequisite units are undertaken or addressed through recognition processes.

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This unit may be included in a skill set provided that it is listed in the schedule of electives (see Qualification Framework) and all prerequisite units are undertaken or addressed through recognition processes.

Delivery and assessment of this unit should be undertaken within regard to the requirements of License to Practice (1.2 above), Prerequisite Competencies and Literacy and Numeracy skills (2 above) and the recommendations for concurrent assessment and relationship with other units (9.5 below).

Practice in the workplace and during training is also subject to regulations directly related to occupational health and safety and where applicable contracts of training such as apprenticeships.

Note:

1. Compliance with permits may be required in various jurisdictions and typically relates to the operation of plant, machinery and equipment such as elevating work platforms, powder operated fixing tools, power operated tools, vehicles, road signage and traffic control and lifting equipment. Permits may also be required for some work environments such as confined spaces, working aloft, near live electrical apparatus and site rehabilitation.

2. Compliance may be required in various jurisdictions relating to currency in First Aid, confined space, lifting, risk safety measures etc.

Licensing/Regulatory Information

License to practice **3)**

The skills and knowledge described in this unit require a license to practice in the workplace where plant and equipment operate at voltage above 50 V a.c. or 120 V a.c. However other conditions may apply in some jurisdictions subject to regulations related to electrical work. Practice in the workplace and during training is also subject to regulations directly related to occupational health and safety and where applicable contracts of training such as apprenticeships.

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Pre-Requisites

Prerequisite Unit(s) **4)**

Competencies **4.1)**

Granting competency in this unit shall be made only after competency in the following unit(s) has/have been confirmed.

UEENEEE101A	Apply Occupational Health and Safety regulations, codes and practices in the workplace
UEENEEE104A	Solve problems in d.c. circuits

Literacy and numeracy skills **4.2)**

Participants are best equipped to achieve competency in this unit if they have reading, writing and numeracy skills indicated by the following scales. Description of each scale is given in Volume 2, Part 3 ‘Literacy and Numeracy’

Reading	4	Writing	4	Numeracy	5

Employability Skills Information

Employability Skills **5)**

This unit contains Employability Skills

The required outcomes described in this unit of competency contain applicable facets of Employability Skills. The Employability Skills Summary of the qualification in which this unit of competency is packaged will assist in identifying Employability Skill requirements.

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Elements and Performance Criteria Pre-Content

6) Elements describe the essential outcomes of a competency standard unit	Performance Criteria describe the required performance needed to demonstrate achievement of the element. Assessment of performance is to be consistent with the Evidence Guide.

Elements and Performance Criteria

ELEMENT		PERFORMANCE CRITERIA	
1	Prepare to work on multiple path ELV a.c. electrical circuits.	1.1	OHS procedures for a given work area are identified, obtained and understood.
		1.2	OHS risk control work preparation measures and procedures are followed.
		1.3	The nature of the circuit(s) problem is obtained from documentation or from work supervisor to establish the scope of work to be undertaken.
		1.4	Advice is sought from the work supervisor to ensure the work is coordinated effectively with others.
		1.5	Sources of materials that may be required for the work are identified and accessed in accordance with established procedures.
		1.6	Tools, equipment and testing devices needed to carry out the work are obtained and checked for correct operation and safety.
2	Solve multiple path ELV a.c. circuit problems.	2.1	OHS risk control work measures and procedures are followed.
		2.2	The need to test or measure live is determined in strict accordance with OHS requirements and when necessary conducted within established safety procedures.
		2.3	Circuits are checked as being isolated where necessary in strict accordance OHS requirements and procedures.
		2.4	Established methods are used to solve a.c. circuit problems from measure and calculated

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ELEMENT	PERFORMANCE CRITERIA	
		values as they apply to multiple path electrical circuit.
	2.5	Unexpected situations are dealt with safely and with the approval of an authorised person.
	2.6	Problems are solved without damage to apparatus, circuits, the surrounding environment or services and using sustainable energy practices.
3 Complete work and document problem solving activities.	3.1	OHS work completion risk control measures and procedures are followed.
	3.2	Work site is cleaned and made safe in accordance with established procedures.
	3.3	Justification for solutions used to solve circuit problems is documented.
	3.4	Work completion is documented and appropriate person(s) notified in accordance with established procedures.

Required Skills and Knowledge

REQUIRED SKILLS AND KNOWLEDGE

8) This describes the essential skills and knowledge and their level, required for this unit.

Evidence shall show that knowledge has been acquired of safe working practices and solving problems in multiple path ELV a.c. circuits.

All knowledge and skills detailed in this unit should be contextualised to current industry practices and technologies.

KS01-EE119A Alternating current principles – single phase

Evidence shall show an understanding of alternating currents principles used in power circuits to an extent indicated by the following aspects:

T1 Sinusoidal alternating voltage and current encompassing:

- Generation of a sinusoidal voltage with a single turn coil rotated in a uniform magnetic field.
- the terms ‘period’, ‘maximum value’, ‘peak-to-peak value’, ‘instantaneous value’, ‘average value’, ‘root-mean-square (r.m.s.) value’, ‘crest factor’ and ‘form factor’

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REQUIRED SKILLS AND KNOWLEDGE

in relation to a sinusoidal waveform.

- the instantaneous value of induced voltage of a generated sinusoidal waveform.
- measurement of the instantaneous, peak, peak-to-peak values and the period of a sinusoidal waveform.
- the root-mean-square (r.m.s.) value and frequency of a sinusoidal waveform .
- phase relationship between two or more sinusoidal waveforms.

T2 Phasors encompassing:

- the terms ‘in-phase’, ‘out-of-phase’, ‘phase angle’, ‘lead’, and ‘lag’.
- the phase angle between two or more alternating quantities from a given sinusoidal waveform diagram.
- convention for representing voltage, current and the reference quantity in a phasor diagram.
- phasor diagrams two or more a.c. values of voltage and/or current.

T3 Resistance in a.c. circuits encompassing:

- connection of a single-source a.c. circuit to take resistance, voltage and current measurements.
- the voltage, current, resistances or power dissipated from measured or given values of any two of these quantities.
- the relationship between voltage drops and current in a resistive a.c. circuit.

T4 Inductance in a.c. circuits encompassing:

- definition of ‘inductive reactance’.
- the inductive reactance of a given inductor and show the relationship between inductive reactance and frequency.
- equivalent inductive reactance in an a.c. circuit or any part of a circuit.
- application of Ohm’s Law to determine voltage, current or inductive reactance in a purely inductive a.c. circuit given any two of these quantities.
- examples of inductive components in power circuits and systems and describe their effect on the phase relationship between voltage and current.
- the comparative current limiting characteristics of inductors and resistors.

T5 Capacitance in a.c. circuits encompassing:

- definition of ‘capacitive reactance’.
- the capacitive reactance of a given capacitor and the relationship between capacitive reactance and frequency.
- equivalent capacitive reactance in an a.c. circuit or any part of a circuit.
- application of Ohm’s Law to determine voltage, current or capacitive reactance in a purely capacitive a.c. circuit given any two of these quantities.
- examples of capacitive components in power circuits and systems and describe their effect on the phase relationship between voltage and current.

T6 Impedance encompassing:

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REQUIRED SKILLS AND KNOWLEDGE

- definition of ‘impedance’.
- impedance of series, parallel and series-parallel circuits and diagrams showing the relationship between resistive, inductive and capacitive components (impedance triangle).
- connection of a single-source a.c. circuit and take resistance, voltage and current measurements.
- voltage, current or impedance values from measured or given values of any two of these quantities.
- phasor diagram usage to solve problems and show the relationship between voltages and currents in a.c. circuits.

T7 Resonance encompassing:

- conditions in a circuit that produce resonance.
- the relationship between resonance and frequency.
- the effect on the current of series resonance and parallel resonance conditions.
- applications where resonance is applied

T8 Power and power factor encompassing:

- difference between true power, apparent power and reactive power and the units.
- definition of the term ”power factor”.
- the effects of low power factor.
- local and AS/NZS 3000 requirements regarding the power factor of an installation and power factor improvement equipment.

Evidence Guide

EVIDENCE GUIDE

9) The evidence guide provides advice on assessment and must be read in conjunction with the Performance Criteria, Required Skills and Knowledge, the Range Statement and the Assessment Guidelines for this Training Package.

The Evidence Guide forms an integral part of this unit. It must be used in conjunction with all parts of the unit and performed in accordance with the Assessment Guidelines of this Training Package.

Overview of Assessment **9.1)**

Longitudinal competency development approaches to assessment, such as Profiling, require data to be reliably gathered in a form that can be consistently interpreted over time. This approach is best

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utilised in Apprenticeship programs and reduces assessment intervention. It is the industry-preferred model for apprenticeships. However, where summative (or final) assessment is used it is to include the application of the competency in the normal work environment or, at a minimum, the application of the competency in a realistically simulated work environment. It is recognised that, in some circumstances, assessment in part or full can occur outside the workplace. However, it must be in accordance with industry and regulatory policy.

Methods chosen for a particular assessment will be influenced by various factors. These include the extent of the assessment, the most effective locations for the assessment activities to take place, access to physical resources, additional safety measures that may be required and the critical nature of the competencies being assessed.

The critical safety nature of working with electricity, electrical equipment, gas or any other hazardous substance/material carries risk in deeming a person competent. Sources of evidence need to be 'rich' in nature to minimise error in judgment.

Activities associated with normal everyday work have a bearing on the decision as to how much and how detailed the data gathered will contribute to its 'richness'. Some skills are more critical to safety and operational requirements while the same skills may be more or less frequently practised. These points are raised for the assessors to consider when choosing an assessment method and developing assessment instruments. Sample assessment instruments are included for Assessors in the Assessment Guidelines of this Training Package.

Critical aspects of evidence required to demonstrate competency in this unit

9.2)

Before the critical aspects of evidence are considered all prerequisites must be met.

Evidence for competence in this unit shall be considered holistically. Each element and associated performance criteria shall be demonstrated on at least two occasions in accordance with the 'Assessment Guidelines – UEE11'. Evidence shall also comprise:

- A representative body of work performance demonstrated

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within the timeframes typically expected of the discipline, work function and industrial environment. In particular this shall incorporate evidence that shows a candidate is able to:

- Implement Occupational Health and Safety workplace procedures and practices, including the use of risk control measures as specified in the performance criteria and range statement
- Apply sustainable energy principles and practices as specified in the performance criteria and range statement
- Demonstrate an understanding of the essential knowledge and associated skills as described in this unit. It may be required by some jurisdictions that RTOs provide a percentile graded result for the purpose of regulatory or licensing requirements.
- Demonstrate an appropriate level of skills enabling employment
- Conduct work observing the relevant Anti Discrimination legislation, regulations, polices and workplace procedures

- Demonstrated consistent performance across a representative range of contexts from the prescribed items below:
  - Solve problems in multiple path ELV a.c. circuits as described in 8) and including:

A Determining the operating parameters of an existing circuit.

B Altering an existing circuit to comply with specified operating parameters.

C Developing circuits to comply with a specified function and operating parameters.

D Dealing with unplanned events by drawing on essential knowledge and skills to provide appropriate solutions incorporated in a holistic assessment with the above listed items.

Context of and specific resources for assessment

9.3)

This unit should be assessed as it relates to normal work practice using procedures, information and resources typical of a workplace. This should include:

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- OHS policy and work procedures and instructions.
- Suitable work environment, facilities, equipment and materials to undertake actual work as prescribed in this unit.

These should be used in the formal learning/assessment environment.

Note:

Where simulation is considered a suitable strategy for assessment, conditions for assessment must be authentic and as far as possible reproduce and replicate the workplace and be consistent with the approved industry simulation policy.

The resources used for assessment should reflect current industry practices in relation to solving problems in multiple path ELV a.c. circuits.

Method of assessment

9.4)

This unit shall be assessed by methods given in Volume 1, Part 3 'Assessment Guidelines'.

Note:

Competent performance with inherent safe working practices is expected in the Industry to which this unit applies. This requires that the specified essential knowledge and associated skills are assessed in a structured environment which is primarily intended for learning/assessment and incorporates all necessary equipment and facilities for learners to develop and demonstrate the essential knowledge and skills described in this unit.

Concurrent assessment and relationship with other units

9.5)

For optimisation of training and assessment effort, competency development in this unit may be arranged concurrently with unit:

UEENEEE10 4A Solve problems in d.c. circuits

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Range Statement

RANGE STATEMENT

10) This relates to the unit as a whole providing the range of contexts and conditions to which the performance criteria apply. It allows for different work environments and situations that will affect performance.

This unit shall be demonstrated in relation to:

- Single source parallel and series-parallel a.c. circuits as they apply to problems related to installation, fault finding, maintenance or development work functions in any of the following disciplines:
  - Computers
  - Data Communications
  - Electrical
  - Electronics
  - Fire protection
  - Instrumentation
  - Refrigeration and Air Conditioning
- In relation to at least two of the following types of circuit problems and on at least two occasions
  - determining the operating parameters of an existing circuit
  - altering an existing circuit to comply with specified operating parameters
  - developing circuits to comply with a specified function and operating parameters

Generic terms used throughout this Vocational Standard shall be regarded as part of the Range Statement in which competency is demonstrated. The definition of these and other terms that apply are given in Volume 2, Part 2.1.

Unit Sector(s)

Not applicable.

Competency Field

Competency Field **11)**

Electrotechnology

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UEENEEE122A Carry out preparatory energy sector work activities

Modification History

Not applicable.

Unit Descriptor

Unit Descriptor **1) Scope:**

1.1) Descriptor

This unit covers the carrying out of preparatory work related to any energy sector work discipline. It encompasses working safely, following basic instructions under direct supervision. It will include energy sector support activities including the use of basic hand tools, the safe use of ladders and elevated work platforms and the fixing and securing of equipment under direction following routine work practices.

Application of the Unit

Application of the Unit **2)**

This unit is intended for competency development in entry-level employment based programs incorporated in approved contracts of training.

Licensing/Regulatory Information

License to practice **3)**

The skills and knowledge described in this unit do not require a license to practice in the workplace. However, practice in this unit is subject to regulations directly related to occupational health and safety and where applicable contracts of training such as apprenticeships.

Note:

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License to practice **3)**

1. Compliance with permits may be required in various jurisdictions and typically relates to the operation of plant, machinery and equipment such as elevating work platforms, powder operated fixing tools, and power operated tools, vehicles, road signage and traffic control, lifting equipment. Permits may also be required for some work environments such as confined spaces, working aloft, near live electrical apparatus and site rehabilitation.

2. Compliance may be required in various jurisdictions relating to currency in First Aid, confined space, lifting and risk safety measures.

Pre-Requisites

Prerequisite Unit(s) **4)**

Competencies **4.1)**

Granting competency in this unit shall be made only after competency in the following unit(s) has/have been confirmed.

UEENEEE101A	Apply Occupational Health and Safety regulations, codes and practices in the workplace
UEENEEE102A	Fabricate, assemble and dismantle utilities industry components
UEENEEE105A	Fix and secure electrotechnology equipment

Literacy and numeracy skills **4.2)**

Participants are best equipped to achieve competency in this unit if they have reading, writing and numeracy skills indicated by the following scales. Description of each scale is given in Volume 2, Part 3 ‘Literacy and Numeracy’

Reading 3 Writing 3 Numeracy 3

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Employability Skills Information

Employability Skills **5)**

This unit contains Employability Skills

The required outcomes described in this unit of competency contain applicable facets of Employability Skills. The Employability Skills Summary of the qualification in which this unit of competency is packaged will assist in identifying Employability Skill requirements.

Elements and Performance Criteria Pre-Content

6) Elements describe the essential outcomes of a competency standard unit

Performance Criteria describe the required performance needed to demonstrate achievement of the element. Assessment of performance is to be consistent with the Evidence Guide.

Elements and Performance Criteria

ELEMENT	PERFORMANCE CRITERIA
1 Plan to carry out basic energy sector support activities.	1.1 OHS procedures for a given work area are obtained and understood through established routines.
	1.2 Established OHS risk control measures in preparation for the work are followed.
	1.3 Safety hazards not previously identified are reported and advice on risk control measures is sought from the work supervisor.
	1.4 Basic work instructions are obtained. The nature and location of the work is obtained from the supervisor or other appropriate person to establish the scope of work to be undertaken.
	1.5 Basic work instructions are sought from the supervisor. Advice is sought from the supervisor

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ELEMENT	PERFORMANCE CRITERIA	
		or other appropriate person to ensure the work is coordinated effectively with others.
	1.6	Sources of materials that may be required for the work are established in accordance with established routines.
	1.7	Tools, equipment and testing devices needed to carry out the work are obtained and checked for correct operation and safety.
2 Undertake energy sector support activities.	2.1	Established OHS risk control measures for carrying out the work are followed.
	2.2	Plant and equipment is checked in strict accordance OHS requirements and procedures.
	2.3	Mechanical equipment is installed straight and square in the required locations and within acceptable tolerances.
	2.4	Use of basic hand and power tools in accordance with safe working practices and OHS requirements.
	2.5	Basic work instructions are carried out under supervision.
	2.6	Procedures for referring non-routine events to immediate supervisor for directions are followed.
3 Complete work and tidy up.	3.1	OHS work completion risk control measures and procedures are followed.
	3.2	Work site is cleaned and made safe in accordance with established procedures.
	3.3	Supervisor is notified of the completion of the work in accordance with established routines.

Required Skills and Knowledge

REQUIRED SKILLS AND KNOWLEDGE

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REQUIRED SKILLS AND KNOWLEDGE

8) This describes the essential skills and knowledge and their level, required for this unit.

Evidence shall show that knowledge has been acquired of safe working practices and carrying out preparatory energy sector work activities.

All knowledge and skills detailed in this unit should be contextualised to current industry practices and technologies.

KS01-EE122A Energy sector work activities support

Evidence shall show an understanding of energy sector work activities support to an extent indicated by the following aspects:

T1 Hand tools and their use encompassing:

- Hand tools for cutting, shaping, drilling, threading, tapping, and finishing metallic and non-metallic components encompassing:
  - types of tools and their purpose
  - techniques for the correct and safe use of these tools
  - hazards associated with their use
  - care and maintenance of hand tools
- Tools for measuring and marking out.
  - types of tools and their purpose
  - techniques for the correct and safe use of these tools
  - hazards associated with their use
  - care and maintenance of hand tools
- Tools for dismantling and assembling electrical and electronic components encompassing:
  - types of tools and their purpose
  - techniques for the correct and safe use of these tools
  - hazards associated with their use
  - care and maintenance of hand tools

T2 Fixed and portable tools and their use encompassing:

- Fixed power tools for cutting, shaping, drilling, and finishing metallic and non-metallic components encompassing:
  - types of tools and their purpose
  - techniques for the correct and safe use of these tools
  - hazards associated with their use
  - care and maintenance of fixed power tools
- Portable power tools for cutting, shaping, drilling, and structural components encompassing:
  - types of tools and their purpose
  - techniques for the correct and safe use of these tools

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REQUIRED SKILLS AND KNOWLEDGE

- hazards associated with their use
- care and maintenance of fixed power tools
- requirements for use on construction sites.

Evidence Guide

EVIDENCE GUIDE

9) The evidence guide provides advice on assessment and must be read in conjunction with the Performance Criteria, Required Skills and Knowledge, the Range Statement and the Assessment Guidelines for this Training Package.

The Evidence Guide forms an integral part of this unit. It must be used in conjunction with all parts of the unit and performed in accordance with the Assessment Guidelines of this Training Package.

Overview of Assessment **9.1)**

Longitudinal competency development approaches to assessment, such as Profiling, require data to be reliably gathered in a form that can be consistently interpreted over time. This approach is best utilised in Apprenticeship programs and reduces assessment intervention. It is the industry-preferred model for apprenticeships. However, where summative (or final) assessment is used it is to include the application of the competency in the normal work environment or, at a minimum, the application of the competency in a realistically simulated work environment. It is recognised that, in some circumstances, assessment in part or full can occur outside the workplace. However, it must be in accordance with industry and regulatory policy.

Methods chosen for a particular assessment will be influenced by various factors. These include the extent of the assessment, the most effective locations for the assessment activities to take place, access to physical resources, additional safety measures that may be required and the critical nature of the competencies being assessed.

The critical safety nature of working with electricity, electrical equipment, gas or any other hazardous substance/material carries risk in deeming a person competent. Sources of evidence need to be ‘rich’ in nature to minimise error in judgment.

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Activities associated with normal everyday work have a bearing on the decision as to how much and how detailed the data gathered will contribute to its 'richness'. Some skills are more critical to safety and operational requirements while the same skills may be more or less frequently practised. These points are raised for the assessors to consider when choosing an assessment method and developing assessment instruments. Sample assessment instruments are included for Assessors in the Assessment Guidelines of this Training Package.

Critical aspects of evidence required to demonstrate competency in this unit

9.2)

Before the critical aspects of evidence are considered all prerequisites must be met.

Evidence for competence in this unit shall be considered holistically. Each element and associated performance criteria shall be demonstrated on at least two occasions in accordance with the 'Assessment Guidelines – UEE11'. Evidence shall also comprise:

- A representative body of work performance demonstrated within the timeframes typically expected of the discipline, work function and industrial environment. In particular this shall incorporate evidence that shows a candidate is able to:
  - Implement Occupational Health and Safety workplace procedures and practices, including the use of risk control measures as specified in the performance criteria and range statement
  - Apply sustainable energy principles and practices as specified in the performance criteria and range statement
  - Demonstrate an understanding of the essential knowledge and associated skills as described in this unit. It may be required by some jurisdictions that RTOs provide a percentile graded result for the purpose of regulatory or licensing requirements.
  - Demonstrate an appropriate level of skills enabling employment
  - Conduct work observing the relevant Anti Discrimination legislation, regulations, polices and workplace procedures
- Demonstrated consistent performance across a representative

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range of contexts from the prescribed items below:

- Carry out preparatory energy sector work activities as described in 8) and including:

A Routing, placing and securing cables to comply with requirements.

B Placing and securing accessories accurately.

C Maintaining fire integrity.

D Dealing with unplanned events by drawing on essential knowledge and skills to provide appropriate solutions incorporated in a holistic assessment with the above listed items.

Note:

Successful completion of relevant vendor training may be used to contribute to evidence on which competency is deemed. In these cases the alignment of outcomes of vendor training with performance criteria and critical aspects of evidence shall be clearly identified.

Context of and specific resources for assessment

9.3)

This unit should be assessed as it relates to normal work practice using procedures, information and resources typical of a workplace. This should include:

- OHS policy and work procedures and instructions.
- Suitable work environment, facilities, equipment and materials to undertake actual work as prescribed in this unit.

These should be used in the formal learning/assessment environment.

Note:

Where simulation is considered a suitable strategy for assessment, conditions for assessment must be authentic and as far as possible reproduce and replicate the workplace and be consistent with the approved industry simulation policy.

The resources used for assessment should reflect current industry practices in relation to carrying out preparatory energy sector work activities.

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Method of assessment **9.4)**

This unit shall be assessed by methods given in Volume 1, Part 3 'Assessment Guidelines'.

Note:

Competent performance with inherent safe working practices is expected in the Industry to which this unit applies. This requires that the specified essential knowledge and associated skills are assessed in a structured environment which is primarily intended for learning/assessment and incorporates all necessary equipment and facilities for learners to develop and demonstrate the essential knowledge and skills described in this unit.

Concurrent assessment and relationship with other units **9.5)**

For optimisation of training and assessment effort, competency development in this unit may be arranged concurrently with unit:

UEENEEE102A	Fabricate, assemble and dismantle utilities industry components
UEENEEE105A	Fix and secure electrotechnology equipment

Range Statement

RANGE STATEMENT

10) This relates to the unit as a whole providing the range of contexts and conditions to which the performance criteria apply. It allows for different work environments and situations that will affect performance.

This unit shall be demonstrated in relation to carrying out preparatory energy sector work activities.

Generic terms used throughout this Vocational Standard shall be regarded as part of the Range Statement in which competency is demonstrated. The definition of these and other terms that apply are given in Volume 2, Part 2.1.

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Unit Sector(s)

Not applicable.

Competency Field

Competency Field **11)**

Electrotechnology

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UEENEEE124A Compile and produce an energy sector detailed report

Modification History

Not applicable.

Unit Descriptor

Unit Descriptor **1) Scope:**

1.1) Descriptor

This unit covers complying and producing an energy sector report. It encompasses determining the safety requirements are met and all regulatory responsibilities are adhered to. The person competent in this unit must demonstrate an ability to identify information sources and collect and analyse and format information applicable to the electrotechnology industry and produce a report as required.

Application of the Unit

Application of the Unit **2)**

This competency standard is suitable for employment-based programs under an approved contract of training at the AQF level of the qualification in which the unit is first packaged or higher.

The unit may be selected as an elective from the relevant schedule (see qualification packaging rules) provided that all prerequisite units are undertaken or addressed through recognition processes.

This unit may be included in a skill set provided that it is listed in the schedule of electives (see Qualification Framework) and all prerequisite units are undertaken or addressed through recognition processes.

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Delivery and assessment of this unit should be undertaken within regard to the requirements of License to Practice (1.2 above), Prerequisite Competencies and Literacy and Numeracy skills (2 above) and the recommendations for concurrent assessment and relationship with other units (9.5 below).

Practice in the workplace and during training is also subject to regulations directly related to occupational health and safety and where applicable contracts of training such as apprenticeships.

Note:

1. Compliance with permits may be required in various jurisdictions and typically relates to the operation of plant, machinery and equipment such as elevating work platforms, powder operated fixing tools, power operated tools, vehicles, road signage and traffic control and lifting equipment. Permits may also be required for some work environments such as confined spaces, working aloft, near live electrical apparatus and site rehabilitation.

2. Compliance may be required in various jurisdictions relating to currency in First Aid, confined space, lifting, risk safety measures etc.

Licensing/Regulatory Information

License to practice **3)**

The skills and knowledge described in this unit do not require a license to practice in the workplace. However, practice in this unit is subject to regulations directly related to occupational health and safety and where applicable contracts of training such as apprenticeships.

Pre-Requisites

Prerequisite Unit(s) **4)**

Competencies **4.1)**

There are no prerequisite competencies for this unit.

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Literacy and numeracy skills **4.2)**

Participants are best equipped to achieve competency in this unit if they have reading, writing and numeracy skills indicated by the following scales. Description of each scale is given in Volume 2, Part 3 'Literacy and Numeracy'

Reading 5 Writing 5 Numeracy 5

Employability Skills Information

Employability Skills **5)**

This unit contains Employability Skills

The required outcomes described in this unit of competency contain applicable facets of Employability Skills. The Employability Skills Summary of the qualification in which this unit of competency is packaged will assist in identifying Employability Skill requirements.

Elements and Performance Criteria Pre-Content

6) Elements describe the essential outcomes of a competency standard unit

Performance Criteria describe the required performance needed to demonstrate achievement of the element. Assessment of performance is to be consistent with the Evidence Guide.

Elements and Performance Criteria

ELEMENT	PERFORMANCE CRITERIA
1 Prepare to develop a energy sector report.	1.1 OHS processes and procedures for a given work area are identified, obtained and understood.
	1.2 Established techniques for report writing are reviewed are adopted in accordance with

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ELEMENT	PERFORMANCE CRITERIA	
		organisation policies.
	1.3	The scope of the report is evaluated and report parameters established using a formal evaluation/survey processes.
	1.4	Criteria from other related works impacting on the report are determined from other sources.
	1.5	Identify source and availability of information.
2 Develop energy sector report.	2.1	Report is developed to include scenarios/requirements established in consultation with appropriate person(s), and regulatory requirements.
	2.2	Report is developed in collaboration with all relevant personnel.
	2.3	Competent persons are identified to assist in the compilation of the report.
	2.4	Report is reviewed against all inputs and adjusted to rectify any anomalies.
	2.5	Compile report in accordance with organisation policies and procedures.
	2.6	Compile and analyse research report information
3 Obtain approval for final energy sector report.	3.1	Report is presented and discussed with person(s) of higher authority.
	3.2	Alterations to the report resulting from the presentation/discussion are negotiated with person(s) of higher authority within the constraints of organisation policy.
	3.3	Final report is presented and approval obtained from appropriate person(s).

Required Skills and Knowledge

REQUIRED SKILLS AND KNOWLEDGE

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REQUIRED SKILLS AND KNOWLEDGE

8) This describes the essential skills and knowledge and their level, required for this unit.

Evidence shall show that knowledge has been acquired of safe working practices and compiling and producing an electrotechnology report.

All knowledge and skills detailed in this unit should be contextualised to current industry practices and technologies.

KS01-EE124A Energy sector detailed report writing

Evidence shall show an understanding of analysis, decision making and reporting as they apply to engineering work functions to an extent indicated by the following aspects:

T1 Communicating with personnel encompassing:

- Oral communications
- Written procedures and work instructions

T2 Communicating with suppliers

T3 Communicating with customers

T4 Purpose and extent of maintaining work activities records in an enterprise encompassing:

- Types of records for maintaining work activities in an enterprise
- Methods for recording and maintaining work records
- Work records required by regulation requirements
- Using basic computer functions encompassing:
- Starting up
- Selecting application
- Entering information
- Saving
- Printing

T5 Techniques of analysis encompassing:

- use of appropriate sampling techniques to collect data.
- types of data and classification.
- effective questionnaire design
- data collection errors.
- frequency tables.
- statistical diagrams – drawing and interpretation.
- the general shape of a frequency distribution.
- different types of diagrams.
- mean time between failures calculations

T6 Summary of statistics encompassing:

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REQUIRED SKILLS AND KNOWLEDGE

- measures of central tendency
- measures of dispersion
- a 5-point summary for a given data set, box and whisker plot distribution
- data sets comparison using measures of centre and spread
- the effect of outliers on measures of centre and spread
- use computer programs or calculators to simplify calculations

T7 Correlation and regression encompassing:

- bivariate data and scatter diagrams.
- product-moment correlation coefficient calculation and interpretation.
- difference between causation and correlation.
- equations of regression lines from bivariate data with a calculator and line plotting on a scatter diagram.
- using the equation of regression to make predictions in practical situations.
- investigation of practical problems using correlation and regression.

T8 Investigation and reporting encompassing:

- presentation of a well formatted report with a clearly stated aim.
- using the internet to obtain relevant data.
- description of the statistical method and design chosen to meet the aim of the investigation.
- statistical analysis and results reporting.
- evaluation and interpretation of the results of the investigation.
- discussion of the investigation with reference to real world applications.
- chronology of the investigation.

Evidence Guide

EVIDENCE GUIDE

9) The evidence guide provides advice on assessment and must be read in conjunction with the Performance Criteria, Required Skills and Knowledge, the Range Statement and the Assessment Guidelines for this Training Package.

The Evidence Guide forms an integral part of this unit. It must be used in conjunction with all parts of the unit and performed in accordance with the Assessment Guidelines of this Training Package.

Overview of Assessment **9.1)**

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Longitudinal competency development approaches to assessment, such as Profiling, require data to be reliably gathered in a form that can be consistently interpreted over time. This approach is best utilised in Apprenticeship programs and reduces assessment intervention. It is the industry-preferred model for apprenticeships. However, where summative (or final) assessment is used it is to include the application of the competency in the normal work environment or, at a minimum, the application of the competency in a realistically simulated work environment. It is recognised that, in some circumstances, assessment in part or full can occur outside the workplace. However, it must be in accordance with industry and regulatory policy.

Methods chosen for a particular assessment will be influenced by various factors. These include the extent of the assessment, the most effective locations for the assessment activities to take place, access to physical resources, additional safety measures that may be required and the critical nature of the competencies being assessed.

The critical safety nature of working with electricity, electrical equipment, gas or any other hazardous substance/material carries risk in deeming a person competent. Sources of evidence need to be ‘rich’ in nature to minimise error in judgment.

Activities associated with normal everyday work have a bearing on the decision as to how much and how detailed the data gathered will contribute to its ‘richness’. Some skills are more critical to safety and operational requirements while the same skills may be more or less frequently practised. These points are raised for the assessors to consider when choosing an assessment method and developing assessment instruments. Sample assessment instruments are included for Assessors in the Assessment Guidelines of this Training Package.

Critical aspects of evidence required to demonstrate competency in this unit

9.2)

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Before the critical aspects of evidence are considered all prerequisites must be met.

Evidence for competence in this unit shall be considered holistically. Each element and associated performance criteria shall be demonstrated on at least two occasions in accordance with the 'Assessment Guidelines – UEE11'. Evidence shall also comprise:

- A representative body of work performance demonstrated within the timeframes typically expected of the discipline, work function and industrial environment. In particular this shall incorporate evidence that shows a candidate is able to:
  - Implement Occupational Health and Safety workplace procedures and practices, including the use of risk control measures as specified in the performance criteria and range statement
  - Apply sustainable energy principles and practices as specified in the performance criteria and range statement
  - Demonstrate an understanding of the essential knowledge and associated skills as described in this unit. It may be required by some jurisdictions that RTOs provide a percentile graded result for the purpose of regulatory or licensing requirements.
  - Demonstrate an appropriate level of skills enabling employment
  - Conduct work observing the relevant Anti Discrimination legislation, regulations, polices and workplace procedures
- Demonstrated consistent performance across a representative range of contexts from the prescribed items below:
  - Compile and produce an energy sector report as described in 8) and including:

A	Typical organisation policies and procedures.
B	Access to a report brief to established report parameters.
C	Access to appropriate person(s) to establish report requirements.
D	Establishing the scope and parameters of the report.
E	Determining the impact of other related works.
F	Developing design brief incorporating scenarios and all requirements.

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G	Appropriate computer application.
H	Identifying competencies required for the report.
I	Documenting report proposal.
J	Negotiating alterations to the proposed report successfully.

Note:
Successful completion of relevant vendor training may be used to contribute to evidence on which competency is deemed. In these cases the alignment of outcomes of vendor training with performance criteria and critical aspects of evidence shall be clearly identified.

Context of and specific resources for assessment

9.3)

This unit should be assessed as it relates to normal work practice using procedures, information and resources typical of a workplace. This should include:

- OHS policy and work procedures and instructions.
- Suitable work environment, facilities, equipment and materials to undertake actual work as prescribed in this unit.

These should be used in the formal learning/assessment environment.

Note:

Where simulation is considered a suitable strategy for assessment, conditions for assessment must be authentic and as far as possible reproduce and replicate the workplace and be consistent with the approved industry simulation policy.

The resources used for assessment should reflect current industry practices in relation to compiling and producing an energy sector report.

Method of assessment

9.4)

This unit shall be assessed by methods given in Volume 1, Part 3

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'Assessment Guidelines'.

Note:
Competent performance with inherent safe working practices is expected in the Industry to which this unit applies. This requires that the specified essential knowledge and associated skills are assessed in a structured environment which is primarily intended for learning/assessment and incorporates all necessary equipment and facilities for learners to develop and demonstrate the essential knowledge and skills described in this unit.

Concurrent assessment and relationship with other units

9.5)

There are no concurrent assessment recommendations for this unit.

Range Statement

RANGE STATEMENT

10) This relates to the unit as a whole providing the range of contexts and conditions to which the performance criteria apply. It allows for different work environments and situations that will affect performance.

This unit of competency describes work conducted by technical personnel who contribute to the conduct of energy sector report writing.

This unit of competency is typically performed by high-level technicians, working as part of a product/application/service research and/or design, development and implementation team. This generally involves working closely with a range of management and production/operations personnel and requires balancing the business and technical sides of the research process.

At this level, personnel should be able to interpret and explain sections/types of legislation, codes, regulations, Australian Standards and Intellectual Property rights that apply to the subject matter being reported upon. This unit of competency should be demonstrated in accordance with the organisations

- Occupational Health and Safety and Workplace Safety policies and procedures
- Goals, values, objectives, plans, systems and processes
- Business and performance plans
- Ethical standards
- Client service standards

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RANGE STATEMENT

- Quality and continuous improvement processes and standards
- Standard Operating Procedures
- Resources
- Technical standards
- Regulatory requirements

Generic terms used throughout this Vocational Standard shall be regarded as part of the Range Statement in which competency is demonstrated. The definition of these and other terms that apply are given in Volume 2, Part 2.1.

Unit Sector(s)

Not applicable.

Competency Field

Competency Field **11)**

Electrotechnology

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UEENEEE131A Solve problems in ELV circuits for non electrical workers

Modification History

Not applicable.

Unit Descriptor

Unit Descriptor **1) Scope:**

1.1) Descriptor

This unit covers basic electrical fundamentals to support non electrical workers in jobs that incorporate some exposure to extra low voltage electricity. It encompasses working safely, recognising basic electrical components and the use of basic voltage, current and resistance measuring devices.

Application of the Unit

Application of the Unit **2)**

2.1) General Application

This unit applies to competency development entry-level employment based programs incorporated in approved contracts of training.

2.2) Importation

RTOs wishing to import this unit into any qualification under the flexibility provisions of NQC Training Package Policy

Licensing/Regulatory Information

License to practice **3)**

During Training: Competency development activities are subject to regulations directly related to licencing, occupational health and safety and where applicable

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License to practice **3)**

contracts of training such as apprenticeships.

In the workplace: The application of the skills and knowledge described in this unit require a license to practice in the workplace where work is carried out on electrical equipment or installations which are designed to operate at voltages greater than 50 V a.c. or 120 V d.c.

Other conditions may apply under State and Territory legislative and regulatory requirements.

Pre-Requisites

Prerequisite Unit(s) **4)**

Competencies **4.1)**

Granting competency in this unit shall be made only after competency in the following unit(s) has/have been confirmed.

UEENEEE101A	Apply Occupational Health and Safety regulations, codes and practices in the workplace

Literacy and numeracy skills **4.2)**

Participants are best equipped to achieve competency in this unit if they have reading, writing and numeracy skills indicated by the following scales. Description of each scale is given in Volume 2, Part 3 ‘Literacy and Numeracy’

Reading	2	Writing	2	Numeracy	2

Employability Skills Information

Employability Skills **5)**

The required outcomes described in this unit of

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Employability Skills	**5)** competency contain applicable facets of Employability Skills. The Employability Skills Summary of the qualification in which this unit of competency is packaged will assist in identifying Employability Skill requirements.

Elements and Performance Criteria Pre-Content

6) Elements describe the essential outcomes of a competency standard unit	Performance Criteria describe the required performance needed to demonstrate achievement of the element. Assessment of performance is to be consistent with the Evidence Guide.

Elements and Performance Criteria

ELEMENT		PERFORMANCE CRITERIA	
1	Prepare to work on simple extra-low voltage electrical circuits.	1.1	OHS procedures for a given work area are identified, obtained and understood.
		1.2	OHS risk control work preparation measures and procedures are followed.
		1.3	Advice is sought from the work supervisor to ensure the work is coordinated effectively with others.
		1.4	Sources of materials that may be required for the work are identified and accessed in accordance with established procedures.
		1.5	Tools, equipment and testing devices needed to carry out the work are obtained and checked for correct operation and safety.
2	Perform basic maintenance and inspection of simple extra low voltage electrical circuits.	2.1	OHS risk control work measures and procedures are followed.
		2.2	The need to test or measure live is determined in strict accordance with OHS requirements and when necessary conducted within established safety procedures.

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ELEMENT	PERFORMANCE CRITERIA	
	2.3	Circuits are checked as being isolated where necessary in strict accordance OHS requirements and procedures.
	2.4	Basic maintenance and inspection procedures are followed.
3 Complete work and report maintenance and inspection activities.	3.1	OHS work completion risk control measures and procedures are followed.
	3.2	Work site is cleaned and made safe in accordance with established procedures.
	3.3	Work completion is documented and appropriate person(s) notified in accordance with established procedures.

Required Skills and Knowledge

REQUIRED SKILLS AND KNOWLEDGE

8) This describes the essential skills and knowledge and their level, required for this unit.

Evidence shall show that knowledge has been acquired of safe working practices and solving problems in extra-low voltage single path circuits.

The knowledge and skills shall be contextualised to current industry standards, technologies and practices.

KS01-EE131A ELV Electrical Fundamentals

Evidence shall show an understanding of electrical fundamentals for non electrical workers to an extent indicated by the following aspects:

T1 Basic electrical concepts encompassing:

- electrical current
- production of electricity by simple renewable and non renewable energy sources
- utilisation of electricity by various loads

T2 Basic electrical circuit encompassing:

- symbols used to represent an electrical energy source, a load, a switch and a circuit protection device in a circuit diagram
- purpose of each component in the circuit
- voltage and current levels in a simple circuit

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REQUIRED SKILLS AND KNOWLEDGE

- relationship between voltage drops and resistance
- setting up and connecting a simple circuitmeasurement of resistance, voltage and current values in a simple circuiteffects of an open-circuit, a closed-circuit and a short-circuit

T3 Electrical power encompassing:

- concepts of power and energy
- effects of power rating of components

T4 Effects of electrical current encompassing:

- physiological effects of current and the fundamental principles (listed in AS/NZS 3000) for protection against the this effect
- typical uses of the effects of current
- fundamental principles (listed in AS/NZS3000) for protection against the damaging effects of current

T5 Electrical energy sources encompassing:

- principles of producing an electric current from motor generator sets
- principles of producing an electrical current from photo-voltaic arrays
- principles of producing an electrical current from primary, and secondary cells

T6 Resistance encompassing:

- power loss (heat) occurring in a conductor.
- effect of losses in electrical wiring and machines
- measurement of resistance

Evidence Guide

EVIDENCE GUIDE

9) This provides essential advice for assessment of the unit. It must be read in conjunction with the performance criteria and the range statement of the unit and the Training Package Assessment Guidelines.

The Evidence Guide forms an integral part of this unit. It must be used in conjunction with all parts of the unit and performed in accordance with the Assessment Guidelines of this Training Package.

Overview of Assessment **9.1)**

Longitudinal competency development approaches to assessment,

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such as Profiling, require data to be reliably gathered in a form that can be consistently interpreted over time. This approach is best utilised in Apprenticeship programs and reduces assessment intervention. It is the industry-preferred model for apprenticeships. However, where summative (or final) assessment is used it is to include the application of the competency in the normal work environment or, at a minimum, the application of the competency in a realistically simulated work environment. It is recognised that, in some circumstances, assessment in part or full can occur outside the workplace. However, it must be in accordance with industry and regulatory policy.

Methods chosen for a particular assessment will be influenced by various factors. These include the extent of the assessment, the most effective locations for the assessment activities to take place, access to physical resources, additional safety measures that may be required and the critical nature of the competencies being assessed.

The critical safety nature of working with electricity, electrical equipment, gas or any other hazardous substance/material carries risk in deeming a person competent. Sources of evidence need to be 'rich' in nature to minimise error in judgment.

Activities associated with normal everyday work have a bearing on the decision as to how much and how detailed the data gathered will contribute to its 'richness'. Some skills are more critical to safety and operational requirements while the same skills may be more or less frequently practised. These points are raised for the assessors to consider when choosing an assessment method and developing assessment instruments. Sample assessment instruments are included for Assessors in the Assessment Guidelines of this Training Package.

Critical aspects of evidence required to demonstrate competency in this unit

9.2)

Before the critical aspects of evidence are considered all prerequisites must be met.

Evidence for competence in this unit shall be considered holistically. Each element and associated performance criteria shall be demonstrated on at least two occasions in accordance with the 'Assessment Guidelines – UEE11'. Evidence shall also

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comprise:

- A representative body of work performance demonstrated within the timeframes typically expected of the discipline, work function and industrial environment. In particular this shall incorporate evidence that shows a candidate is able to:
  - Implement Occupational Health and Safety workplace procedures and practices, including the use of risk control measures as specified in the performance criteria and range statement
  - Apply sustainable energy principles and practices as specified in the performance criteria and range statement
  - Demonstrate an understanding of the essential knowledge and associated skills as described in this unit. It may be required by some jurisdictions that RTOs provide a percentile graded result for the purpose of regulatory or licensing requirements.
  - Demonstrate an appropriate level of skills enabling employment
  - Conduct work observing the relevant Anti Discrimination legislation, regulations, polices and workplace procedures
- Demonstrated consistent performance across a representative range of contexts from the prescribed items below:
  - Performing basic maintenance on simple extra-low voltage circuits as described in 8) and including:

A Following basic maintenance procedures

B Reporting information arising from basic maintenance and inspection.

C Dealing with unplanned events by drawing on essential knowledge and skills to provide appropriate solutions incorporated in a holistic assessment with the above listed items.

Context of and specific resources for assessment

9.3)

This unit should be assessed as it relates to normal work practice using procedures, information and resources typical of a workplace. This should include:

- OHS policy and work procedures and instructions.
- Suitable work environment, facilities, equipment and materials

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to undertake actual work as prescribed in this unit.

These should be used in the formal learning/assessment environment.

Note:

Where simulation is considered a suitable strategy for assessment, conditions for assessment must be authentic and as far as possible reproduce and replicate the workplace and be consistent with the approved industry simulation policy.

The resources used for assessment should reflect current industry practices in relation to in extra-low voltage single path circuits.

Method of assessment

9.4)

This unit shall be assessed by methods given in Volume 1, Part 3 'Assessment Guidelines'.

Note:

Competent performance with inherent safe working practices is expected in the Industry to which this unit applies. This requires that the specified essential knowledge and associated skills are assessed in a structured environment which is primarily intended for learning/assessment and incorporates all necessary equipment and facilities for learners to develop and demonstrate the essential knowledge and skills described in this unit.

Concurrent assessment and relationship with other units

9.5)

There are no concurrent assessment recommendations for this unit.

Range Statement

RANGE STATEMENT

10) This relates to the unit as a whole providing the range of contexts and conditions to which the performance criteria apply. It allows for different work environments and situations that will affect performance.

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RANGE STATEMENT

- This unit shall be demonstrated in relation to simple circuits as they apply to maintenance work functions in any of the following disciplines:
  - Renewable and sustainable energy systems, and
  - Remote area essential service operations
- In relation to the following on at least two occasions:
  - Identifying the components of an existing circuit
  - making and reporting measurements of circuit parameters

Generic terms used throughout this Vocational Standard shall be regarded as part of the Range Statement in which competency is demonstrated. The definition of these and other terms that apply are given in Volume 2, Part 2.1.

Unit Sector(s)

Not applicable.

Competency Field

Competency Field **11)**

Electrotechnology

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UEENEEE137A Document and apply measures to control OHS risks associated with electrotechnology work

Modification History

Not Applicable

Unit Descriptor

Unit Descriptor **1**)

1.1) Descriptor

This unit covers identifying occupational health and safety hazard and risks and documenting control measures. It encompasses identifying workplace hazards, assigning levels of risk, developing control measures to eliminate and/or mitigate risks, reviewing risk control measures and maintaining documentation of hazards, risk control measures and their application in accordance with compliance procedures.

Application of the Unit

Not Applicable

Licensing/Regulatory Information

1.2) License to practice

During Training: Competency development activities are subject to regulations directly related to licencing, occupational health and safety and where applicable contracts of training such as apprenticeships.

In the workplace: The application of the skills and knowledge described in this unit require a license to practice in the workplace where work is carried out on electrical equipment or installations which are designed to operate at voltages greater than 50 V a.c. or 120 V d.c.

Other conditions may apply under State and Territory legislative and regulatory requirements.

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Pre-Requisites

Prerequisite Unit(s) **2)**

2.1) Competencies

Granting competency in this unit shall be made only after competency in the following unit(s) has/have been confirmed.

UEENEEE101A	Apply Occupational Health and Safety regulations, codes and practices in the workplace

Employability Skills Information

Employability Skills **3)**

This unit contains Employability Skills

The required outcomes described in this competency standard unit contain applicable facets of Employability Skills. The Employability Skills Summary of the qualification in which this competency standard unit is packaged will assist in identifying Employability Skill requirements.

Application of the Unit **4)**

This unit addresses information, processes and techniques for the application of occupational health and safety specific to working with electrotechnology and is essential for employees without managerial or supervisory responsibilities

Elements and Performance Criteria Pre-Content

6) Elements describe
the essential outcomes

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of a unit of competency

Elements and Performance Criteria

ELEMENT	PERFORMANCE CRITERIA
1 Identify and document hazards and risks.	1.1 Hazards are identified the appropriate persons involved and in accordance with compliance procedures. Note: Typically this will relate to such things as: The type of job, Electrical conditions, Energy levels, Radiation levels, Toxic substances, Airborne particles, Pressure discharge, Explosive atmosphere, Work-site location, General work-site conditions, Specific work location, Moving parts, Tools and equipment, Workers competence and/or capacity and/or personal effects
	1.2 Risks associated with identified hazards are determined in consultation with others and documented in accordance with compliance procedures.
	1.3 Provision is made to accommodate changes to documentation should unforseen hazards be identified.
2 Assign levels of risk and develop and document control measures.	2.1 Level of risk is assigned for each identified hazard in accordance with the regulations and following compliance procedures.
	2.2 Control measures are developed for hazard, level of risk and activity to eliminate and/or mitigate the risk following compliance procedures.
	2.3 Hazard, level of risk and control measures are agreed to and documented in consultation with all involved in accordance with compliance procedures.
3 Monitor and review the control measures.	3.1 Documented control measures are made available for reference by all involved with the work.
	3.2 Control measures are modified where required in consultation with all involved with the work in accordance with compliance procedures.
	3.3 Documentation of hazards, risk control measures and their application are filed in accordance with

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ELEMENT **PERFORMANCE CRITERIA**

compliance procedures.

Required Skills and Knowledge

REQUIRED SKILLS AND KNOWLEDGE

7) This describes the essential skills and knowledge and their level, required for this unit.

Evidence shall show that knowledge has been acquired of safe working practices and documenting occupational hazards and risks in electrical.

The knowledge and skills shall be contextualised to current industry standards, technologies and practices.

KS01-EE137A **Risks and control measures for dealing with workplace hazards**

Evidence shall show an understanding of risks and control measures for dealing with workplace hazards to an extent indicated by the following aspects:

T1 Risk management and assessment of risk encompassing:

- Principle and purpose of risk management, and
- Processes for conducting a risk assessment
- Hazard identification by job analysis and work-site inspections
- Recording hazards and assessing the risk.

T2 Hazards and risks and control measures in working on construction sites encompassing:

- Hazards include manual and mechanical handling; working at heights; working in confined spaces; noise; dusts, gases, chemicals.

T3 Hazards associated with extra-low voltage, low-voltage and high-currents encompassing:

- Arrangement of power distribution and circuits in electrical installations
- Parts of an electrical system and equipment that operate at low-voltage and extra-low voltage,
- Parts of an electrical system and equipment where high-currents are likely.

T4 Hazards and risks and control measures associated with high-voltage encompassing:

- Parts of an electrical system and equipment that operate at high-voltage,
- The terms ‘touch voltage’, ‘step voltage’, ‘induced voltage’ and ‘creepage’ as they relate to the hazards of high-voltage
- Control measures used for dealing with the hazards of high-voltage.

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REQUIRED SKILLS AND KNOWLEDGE

T5 Hazards and risks and control measures in working with low voltage equipment encompassing:

- Risks in modifying electrical installations, fault finding, maintenance and repair.
- Control measures before, while and after working on electrical installations, circuits or equipment.
- Isolation and tagging-off procedures.
- Risks and restrictions in working live.
- Control measures for working live.

T6 Hazards and risks and control measures associated with harmful, devices, materials, gases, dusts and airborne contaminant encompassing:

- Harmful devices: gas touches, welding equipment, laser equipped devises and the like.
- Harmful materials: gases (refrigerants) and some industrial cleaning agents, fibres of optical cable, thermal insulation
- Harmful airborne contaminants: fibres of thermal insulation, fibres of optical cable, fibrous cement materials, asbestos and other fibres in insulation materials.

T7 Determine the degree of the risk encompassing:

- The three recognised levels of risk are:
  - High (potential to kill or permanent disability);
  - Medium (potential to cause an injury or illness of a permanent nature);
  - Low (potential to cause a cause minor injury requiring first aid but no permanent disability)

T8 Use control measures to eliminate or control the risk encompassing:

- Hierarchy of control measures are:
  - eliminate the risk by discontinuing the activity.
  - control the risk by redesigning the equipment
  - adopt administrative procedures
  - use of personal protective equipment.
- Control measures are formally documented in Job Safety Analysis (JSAs) or Safe Work Methods (SWMs).

T9 Engaging in monitoring and reviewing processes to ensure control measures remain valid.

Evidence Guide

EVIDENCE GUIDE

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EVIDENCE GUIDE

9) The evidence guide provides advice on assessment and must be read in conjunction with the Performance Criteria, Required Skills and Knowledge, the Range Statement and the Assessment Guidelines for this Training Package.

The Evidence Guide forms an integral part of this unit. It must be used in conjunction with all parts of the unit and performed in accordance with the Assessment Guidelines of this Training Package.

Overview of Assessment

9.**1**)

Longitudinal competency development approaches to assessment, such as Profiling, require data to be reliably gathered in a form that can be consistently interpreted over time. This approach is best utilised in Apprenticeship programs and reduces assessment intervention. It is the industry-preferred model for apprenticeships. However, where summative (or final) assessment is used it is to include the application of the competency in the normal work environment or, at a minimum, the application of the competency in a realistically simulated work environment. It is recognised that, in some circumstances, assessment in part or full can occur outside the workplace. However, it must be in accordance with industry and regulatory policy.

Methods chosen for a particular assessment will be influenced by various factors. These include the extent of the assessment, the most effective locations for the assessment activities to take place, access to physical resources, additional safety measures that may be required and the critical nature of the competencies being assessed.

The critical safety nature of working with electricity, electrical equipment, gas or any other hazardous substance/material carries risk in deeming a person competent. Sources of evidence need to be 'rich' in nature to minimise error in judgment.

Activities associated with normal everyday work have a bearing on the decision as to how much and how detailed the data gathered will contribute to its 'richness'. Some skills are more critical to safety and operational requirements while the same skills may be more or less frequently practised. These points are raised for the assessors to consider when choosing an assessment method and developing assessment instruments. Sample assessment instruments are included for Assessors in the Assessment Guidelines of this Training Package.

Critical aspects of evidence required to demonstrate

9.**2**)

Before the critical aspects of evidence are considered all prerequisites must be met.

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EVIDENCE GUIDE

competency in this unit

Evidence for competence in this unit shall be considered holistically. Each element and associated performance criteria shall be demonstrated on at least two occasions in accordance with the 'Assessment Guidelines - UEE07'. Evidence shall also comprise:

- A representative body of work performance demonstrated within the timeframes typically expected of the discipline, work function and industrial environment. In particular this shall incorporate evidence that shows a candidate is able to:
  - Implement Occupational Health and Safety workplace procedures and practices, including the use of risk control measures as specified in the performance criteria and range statement
  - Apply sustainable energy principles and practices as specified in the performance criteria and range statement
  - Demonstrate an understanding of the essential knowledge and associated skills as described in this unit. It may be required by some jurisdictions that RTOs provide a percentile graded result for the purpose of regulatory or licensing requirements.
  - Demonstrate an appropriate level of skills enabling employment
  - Conduct work observing the relevant Anti Discrimination legislation, regulations, polices and workplace procedures
- Demonstrated consistent performance across a representative range of contexts from the prescribed items below:
  - Document and applying measure to control occupational health and safety risks in electrotechnology work as described in 8) and including:

    A Identifying with appropriate person and in accordance with compliance procedures.

    B Determining the risk associated with identified hazards

    C Assigning the risks and developing and documenting control measures.

    D Reviewing and modifying control measures where required.

    E Recording activities.

    F Dealing with unplanned events

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EVIDENCE GUIDE

Context of and specific resources for assessment

9.3)

This unit should be assessed as it relates to normal work practice using procedures, information and resources typical of a workplace. This should include:

- OHS policy and work procedures and instructions.
- Suitable work environment, facilities, equipment and materials to undertake actual work as prescribed in this unit.

These should be used in the formal learning/assessment environment.

Note:

Where simulation is considered a suitable strategy for assessment, conditions for assessment must be authentic and as far as possible reproduce and replicate the workplace and be consistent with the approved industry simulation policy.

The resources used for assessment should reflect current industry practices in relation to documenting occupational hazards and risks in electrical.

Method of assessment

9.4)

This unit shall be assessed by methods given in Volume 1, Part 3 'Assessment Guidelines'.

Note:
Competent performance with inherent safe working practices is expected in the Industry to which this unit applies. This requires that the specified essential knowledge and associated skills are assessed in a structured environment which is primarily intended for learning/assessment and incorporates all necessary equipment and facilities for learners to develop and demonstrate the essential knowledge and skills described in this unit.

Concurrent assessment and relationship with other units

9.5)

For optimisation of training and assessment effort, competence in this unit may be assessed concurrently with other related units making up a qualification or possible skill clusters.

Components of this unit are also included in the critical aspects of evidence of all units to help ensure the appropriate level of responsibility for safety has been acquired.

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Range Statement

RANGE STATEMENT

8) This relates to the unit as a whole providing the range of contexts and conditions to which the performance criteria apply. It allows for different work environments and situations that will affect performance.

This unit shall be demonstrated in relation to electrotechnology work functions, including but limited to: installation, testing, inspection, fault finding, maintenance or development work functions covering:

- Relevant occupational health and safety legislation, regulations and codes of practice related to devices and systems and hazards present in residential, commercial and industrial workplaces.
- Accepted industry work procedures and the specific safety procedures and work instructions for a particular workplace or organistaion.

In any of the following disciplines:

- Appliances
- Business equipment
- Computers
- Data Communications
- Electrical
- Electrical Machines
- Electronics
- Fire protection
- Instrumentation and Control
- Refrigeration and Air Conditioning
- Renewable / sustainable energy
- Security technology
- Energy Supply, Transmission and Distribution Networks

Generic terms used throughout this Vocational Standard shall be regarded as part of the Range Statement in which competency is demonstrated. The definition of these and other terms that apply are given in Volume 2, Part 2.1.

Unit Sector(s)

Not Applicable

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Competency Field

2.2) Literacy and numeracy skills

Participants are best equipped to achieve competency in this unit if they have reading, writing and numeracy skills indicated by the following scales. Description of each scale is given in Volume 2, Part 3 'Literacy and Numeracy'

Reading	3	Writing	3	Numeracy	3

Custom Content Section

Competency Field **5**)

Electrotechnology

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UEENEEE151A Transport apparatus, equipment and materials

Modification History

Not applicable.

Unit Descriptor

Unit Descriptor **1) Scope:**

1.1) Descriptor

This unit covers transport apparatus, plant accessories and materials. It encompasses safe working practices and following work processes that satisfy electrical principles for transporting apparatus and materials.

Application of the Unit

Application of the Unit **2)**

This unit shall apply to persons entering work in energy sector and may be used in school-based vocational programs.

Licensing/Regulatory Information

License to practice **3)**

The skills and knowledge described in this unit do not require a license to practice in the workplace. However practice in this unit is subject to regulations directly related to occupational health and safe and contracts of training such as new apprenticeships.

Note:

1. Compliance with permits may be required in various jurisdictions and typically relates to the operation of plant, machinery and equipment such as elevating work platforms, powder operated fixing tools, and power operated tools, vehicles, road signage and traffic control,

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License to practice **3)**

lifting equipment. Permits may also be required for some work environments such as confined spaces, working aloft, near live electrical apparatus and site rehabilitation.

2. Compliance may be required in various jurisdictions relating to currency in First Aid, confined space, lifting and risk safety measures.

Pre-Requisites

Prerequisite Unit(s) **4)**

Competencies **4.1)**

There are no prerequisite competencies for this unit.

Literacy and numeracy skills **4.2)**

Participants are best equipped to achieve competency in this unit if they have reading, writing and numeracy skills indicated by the following scales. Description of each scale is given in Volume 2, Part 3 ‘Literacy and Numeracy’

Reading 3 Writing 3 Numeracy 3

Employability Skills Information

Employability Skills **5)**

This unit contains Employability Skills

The required outcomes described in this unit of competency contain applicable facets of Employability Skills. The Employability Skills Summary of the qualification in which this unit of competency is packaged will assist in identifying Employability Skill requirements.

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Elements and Performance Criteria Pre-Content

6) Elements describe the essential outcomes of a competency standard unit	Performance Criteria describe the required performance needed to demonstrate achievement of the element. Assessment of performance is to be consistent with the Evidence Guide.

Elements and Performance Criteria

ELEMENT		PERFORMANCE CRITERIA	
1	Plan and prepare for the transport of apparatus and materials.	1.1	Transport of apparatus and materials is planned and prepared to ensure OHS policies and procedures are followed, the work is appropriately sequenced in accordance with requirements.
		1.2	Appropriate personnel are consulted to ensure apparatus; accessories, plant, equipment and/or materials are appropriately identified, and checked against manufacturer transport instructions and requirements.
		1.3	Transport details of apparatus and materials are checked against job requirements.
		1.4	Plant needed to carry out the work is obtained in accordance with established procedures and checked for correct operation and safety.
		1.5	Where appropriate, team and individual work roles and responsibilities within the team are identified.
		1.6	Preparatory work is checked to ensure no damage has occurred and complies with requirements.
2	Transport apparatus and materials.	2.1	OHS policies and procedures for the transport of apparatus plant and materials are followed.
		2.2	Apparatus, plant and materials are transported in accordance with requirements, and manufacturer transport instructions without damage or distortion to the surrounding environment or services.

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ELEMENT	PERFORMANCE CRITERIA	
	2.3	Unplanned events or conditions are responded to in accordance with established procedure.
	2.4	Approval is obtained in accordance with established procedures from appropriate personnel before any contingencies are implemented.
	2.5	Ongoing checks of the work quality are undertaken in accordance with established procedures.
3 Check and notify completion of work.	3.1	Final inspections are undertaken to ensure the transported apparatus and materials conforms to requirements.
	3.2	Work completion is notified in accordance with established procedures.

Required Skills and Knowledge

REQUIRED SKILLS AND KNOWLEDGE

8) This describes the essential skills and knowledge and their level, required for this unit.

Evidence shall show that knowledge has been acquired of safe working practices and transporting energy sector apparatus and materials.

All knowledge and skills detailed in this unit should be contextualised to current industry practices and technologies.

KS01-EE151A Energy sector apparatus and materials transport

Evidence shall show an understanding of energy sector apparatus and materials transport to an extent indicted by the following aspects:

T1 Energy sector apparatus encompassing:

- Types of apparatus used in the electrotechnology, ESI and gas industry

T2 Energy sector materials encompassing:

- Types of materials used in the electrotechnology, ESI and gas industry
- OH&S requirement

T3 Energy sector transport encompassing:

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REQUIRED SKILLS AND KNOWLEDGE

- Types of transport used in the electrotechnology, ESI and gas industry
- Manual handling techniques

Evidence Guide

EVIDENCE GUIDE

9) The evidence guide provides advice on assessment and must be read in conjunction with the Performance Criteria, Required Skills and Knowledge, the Range Statement and the Assessment Guidelines for this Training Package.

The Evidence Guide forms an integral part of this unit. It must be used in conjunction with all parts of the unit and performed in accordance with the Assessment Guidelines of this Training Package.

Overview of Assessment **9.1)**

Longitudinal competency development approaches to assessment, such as Profiling, require data to be reliably gathered in a form that can be consistently interpreted over time. This approach is best utilised in Apprenticeship programs and reduces assessment intervention. It is the industry-preferred model for apprenticeships. However, where summative (or final) assessment is used it is to include the application of the competency in the normal work environment or, at a minimum, the application of the competency in a realistically simulated work environment. It is recognised that, in some circumstances, assessment in part or full can occur outside the workplace. However, it must be in accordance with industry and regulatory policy.

Methods chosen for a particular assessment will be influenced by various factors. These include the extent of the assessment, the most effective locations for the assessment activities to take place, access to physical resources, additional safety measures that may be required and the critical nature of the competencies being assessed.

The critical safety nature of working with electricity, electrical equipment, gas or any other hazardous substance/material carries risk in deeming a person competent. Sources of evidence need to be ‘rich’ in nature to minimise error in judgment.

Activities associated with normal everyday work have a bearing on the decision as to how much and how detailed the data gathered

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will contribute to its 'richness'. Some skills are more critical to safety and operational requirements while the same skills may be more or less frequently practised. These points are raised for the assessors to consider when choosing an assessment method and developing assessment instruments. Sample assessment instruments are included for Assessors in the Assessment Guidelines of this Training Package.

Critical aspects of evidence required to demonstrate competency in this unit **9.2)**

Before the critical aspects of evidence are considered all prerequisites must be met.

Evidence for competence in this unit shall be considered holistically. Each element and associated performance criteria shall be demonstrated on at least two occasions in accordance with the 'Assessment Guidelines – UEE11'. Evidence shall also comprise:

- A representative body of work performance demonstrated within the timeframes typically expected of the discipline, work function and industrial environment. In particular this shall incorporate evidence that shows a candidate is able to:
  - Implement Occupational Health and Safety workplace procedures and practices, including the use of risk control measures as specified in the performance criteria and range statement
  - Apply sustainable energy principles and practices as specified in the performance criteria and range statement
  - Demonstrate an understanding of the essential knowledge and associated skills as described in this unit. It may be required by some jurisdictions that RTOs provide a percentile graded result for the purpose of regulatory or licensing requirements.
  - Demonstrate an appropriate level of skills enabling employment
  - Conduct work observing the relevant Anti Discrimination legislation, regulations, polices and workplace procedures
- Demonstrated consistent performance across a representative range of contexts from the prescribed items below:
  - Transport apparatus and materials as described in 8) and

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including:

A Transporting apparatus.

B Transporting equipment.

C Dealing with unplanned events by drawing on essential knowledge and skills to provide appropriate solutions incorporated in a holistic assessment with the above listed items.

Note:
Successful completion of relevant vendor training may be used to contribute to evidence on which competency is deemed. In these cases the alignment of outcomes of vendor training with performance criteria and critical aspects of evidence shall be clearly identified.

Context of and specific resources for assessment

9.3)

This unit should be assessed as it relates to normal work practice using procedures, information and resources typical of a workplace. This should include:

- OHS policy and work procedures and instructions.
- Suitable work environment, facilities, equipment and materials to undertake actual work as prescribed in this unit.

These should be used in the formal learning/assessment environment.

Note:

Where simulation is considered a suitable strategy for assessment, conditions for assessment must be authentic and as far as possible reproduce and replicate the workplace and be consistent with the approved industry simulation policy.

The resources used for assessment should reflect current industry practices in relation to transporting apparatus and materials.

Method of assessment

9.4)

This unit shall be assessed by methods given in Volume 1, Part 3

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'Assessment Guidelines'.

Note:

Competent performance with inherent safe working practices is expected in the Industry to which this unit applies. This requires that the specified essential knowledge and associated skills are assessed in a structured environment which is primarily intended for learning/assessment and incorporates all necessary equipment and facilities for learners to develop and demonstrate the essential knowledge and skills described in this unit.

Concurrent assessment and relationship with other units

9.5)

There are no concurrent assessment recommendations for this unit.

Range Statement

RANGE STATEMENT

10) This relates to the unit as a whole providing the range of contexts and conditions to which the performance criteria apply. It allows for different work environments and situations that will affect performance.

This unit shall be demonstrated in relation to transporting apparatus and equipment in any of the following disciplines:

- Appliances
- Business equipment
- Computers
- Data Communications
- Electrical
- Electrical Machines
- Electronics
- Fire protection
- Instrumentation
- Refrigeration and Air Conditioning
- Renewable / sustainable energy
- Security technology

Generic terms used throughout this Vocational Standard shall be regarded as part of

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RANGE STATEMENT

the Range Statement in which competency is demonstrated. The definition of these and other terms that apply are given in Volume 2, Part 2.1.

Unit Sector(s)

Not applicable.

Competency Field

Competency Field **11)**

Electrotechnology

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UEENEEE185A Write work activity reports

Modification History

Not applicable.

Unit Descriptor

Unit Descriptor **1) Scope:**

1.1) Descriptor

This unit covers writing reports related to installation, fault finding, servicing/maintenance and safety in an energy sector discipline. It encompasses a relevant level of understanding of the energy sector discipline subject to the reports, gathering relevant information from appropriate sources; make deductions from the information obtained, arranging reports in a logical sequence and writing in clear English.

Application of the Unit

Application of the Unit **2)**

This competency standard is suitable for employment-based programs under an approved contract of training at the AQF level of the qualification in which the unit is first packaged or higher.

The unit may be selected as an elective from the relevant schedule (see qualification packaging rules) provided that all prerequisite units are undertaken or addressed through recognition processes.

This unit may be included in a skill set provided that it is listed in the schedule of electives (see Qualification Framework) and all prerequisite units are undertaken or addressed through recognition processes.

Delivery and assessment of this unit should be

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undertaken within regard to the requirements of License to Practice (1.2 above), Prerequisite Competencies and Literacy and Numeracy skills (2 above) and the recommendations for concurrent assessment and relationship with other units (9.5 below).

Practice in the workplace and during training is also subject to regulations directly related to occupational health and safety and where applicable contracts of training such as apprenticeships.

Note:

1. Compliance with permits may be required in various jurisdictions and typically relates to the operation of plant, machinery and equipment such as elevating work platforms, powder operated fixing tools, power operated tools, vehicles, road signage and traffic control and lifting equipment. Permits may also be required for some work environments such as confined spaces, working aloft, near live electrical apparatus and site rehabilitation.

2. Compliance may be required in various jurisdictions relating to currency in First Aid, confined space, lifting, risk safety measures etc.

Licensing/Regulatory Information

License to practice **3)**

The skills and knowledge described in this unit do not require a license to practice in the workplace. However, practice in this unit is subject to regulations directly related to occupational health and safety and where applicable contracts of training such as apprenticeships.

Pre-Requisites

Prerequisite Unit(s) **4)**

Competencies **4.1)**

There are no prerequisite competencies for this unit.

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Literacy and numeracy skills **4.2)**

Participants are best equipped to achieve competency in this unit if they have reading, writing and numeracy skills indicated by the following scales. Description of each scale is given in Volume 2, Part 3 'Literacy and Numeracy'

Reading 5 Writing 5 Numeracy 5

Employability Skills Information

Employability Skills **5)**

The required outcomes described in this unit of competency contain applicable facets of Employability Skills. The Employability Skills Summary of the qualification in which this unit of competency is packaged will assist in identifying Employability Skill requirements.

Elements and Performance Criteria Pre-Content

6) Elements describe the essential outcomes of a competency standard unit

Performance Criteria describe the required performance needed to demonstrate achievement of the element. Assessment of performance is to be consistent with the Evidence Guide.

Elements and Performance Criteria

ELEMENT	PERFORMANCE CRITERIA
1 Prepare to develop a report.	1.1 The need for a report is determined from particular circumstances and /or request in accordance with established procedures
	1.2 The purpose and scope of the report is ascertained from the particular circumstances and /or request in accordance with established

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ELEMENT	PERFORMANCE CRITERIA	
		procedures.
	1.3	OHS processes and procedures for a given work area are identified, obtained and understood.
	1.4	Sources of information needed for the report are identified and obtained in consultation with appropriate persons and in accordance with established procedures.
2 Write report.	2.1	Report is developed in consultation with appropriate persons.
	2.2	Report is developed to include all relevant information obtained
	2.3	Information in the report is arranged in a logical sequence including deductions recommendations where appropriate.
	2.4	Report is written in clear English and in accordance with organisation policies and procedures.
3 Obtain approval for final report.	3.1	Report is presented and discussed with person(s) of higher authority.
	3.2	Alterations to the report resulting from the presentation/discussion are negotiated with person(s) of higher authority within the constraints of organisation policy.
	3.3	Final report is presented and approval obtained from appropriate person(s).

Required Skills and Knowledge

REQUIRED SKILLS AND KNOWLEDGE

8) This describes the essential skills and knowledge and their level, required for this unit.

Evidence shall show that knowledge has been acquired of safe working practices and writing a work activity report.

All knowledge and skills detailed in this unit should be contextualised to current

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REQUIRED SKILLS AND KNOWLEDGE

industry practices and technologies.

KS01-EG185A Work activity reporting

Evidence shall show an understanding of work activity reporting to an extent indicated by the following aspects:

T1 Scope of work activity reports encompassing:

- Installation, fault finding/repair, servicing/maintenance and safety work activities.
- Reports in response to an enquiry, situation, investigation, problem and incident.

T2 Sources of information

- Examples include (but not limited to) work colleagues, customer/client personnel, standards, specifications and direct experience of the enquiry, situation, investigation, problem or incident that is subject of the report

T3 Structure of reports encompassing:

- The description and/or explanation of the subject matter in logical sequence of facts
- Arrangement of content

T4 Clear English writing techniques

Evidence Guide

EVIDENCE GUIDE

9) This provides essential advice for assessment of the unit. It must be read in conjunction with the performance criteria and the range statement of the unit and the Training Package Assessment Guidelines.

The Evidence Guide forms an integral part of this unit. It must be used in conjunction with all parts of the unit and performed in accordance with the Assessment Guidelines of this Training Package.

Overview of Assessment **9.1)**

Longitudinal competency development approaches to assessment, such as Profiling, require data to be reliably gathered in a form that can be consistently interpreted over time. This approach is best utilised in Apprenticeship programs and reduces assessment intervention. It is the industry-preferred model for apprenticeships. However, where summative (or final) assessment is used it is to

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include the application of the competency in the normal work environment or, at a minimum, the application of the competency in a realistically simulated work environment. It is recognised that, in some circumstances, assessment in part or full can occur outside the workplace. However, it must be in accordance with industry and regulatory policy.

Methods chosen for a particular assessment will be influenced by various factors. These include the extent of the assessment, the most effective locations for the assessment activities to take place, access to physical resources, additional safety measures that may be required and the critical nature of the competencies being assessed.

The critical safety nature of working with electricity, electrical equipment, gas or any other hazardous substance/material carries risk in deeming a person competent. Sources of evidence need to be 'rich' in nature to minimise error in judgment.

Activities associated with normal everyday work have a bearing on the decision as to how much and how detailed the data gathered will contribute to its 'richness'. Some skills are more critical to safety and operational requirements while the same skills may be more or less frequently practised. These points are raised for the assessors to consider when choosing an assessment method and developing assessment instruments. Sample assessment instruments are included for Assessors in the Assessment Guidelines of this Training Package.

Critical aspects of evidence required to demonstrate competency in this unit

9.2)

Before the critical aspects of evidence are considered all prerequisites must be met.

Evidence for competence in this unit shall be considered holistically. Each element and associated performance criteria shall be demonstrated on at least two occasions in accordance with the 'Assessment Guidelines – UEE11'. Evidence shall also comprise:

- A representative body of work performance demonstrated within the timeframes typically expected of the discipline, work function and industrial environment. In particular this shall incorporate evidence that shows a candidate is able to:

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- Implement Occupational Health and Safety workplace procedures and practices, including the use of risk control measures as specified in the performance criteria and range statement
- Apply sustainable energy principles and practices as specified in the performance criteria and range statement
- Demonstrate an understanding of the essential knowledge and associated skills as described in this unit. It may be required by some jurisdictions that RTOs provide a percentile graded result for the purpose of regulatory or licensing requirements.
- Demonstrate an appropriate level of skills enabling employment
- Conduct work observing the relevant Anti Discrimination legislation, regulations, polices and workplace procedures

- Demonstrated consistent performance across a representative range of contexts from the prescribed items below:
  - Compile and produce an electrotechnology report as described in 8) and including:

A	Determining the need for a report
B	Ascertaining the purpose and scope of a report
C	Sources and obtain information relevant to a report
D	Including all relevant information
E	Arranging reports in a logical sequence
F	Writing reports in plain English
G	Obtaining approval for the report
H	Dealing with unplanned events

Note:
Successful completion of relevant vendor training may be used to contribute to evidence on which competency is deemed. In these cases the alignment of outcomes of vendor training with performance criteria and critical aspects of evidence shall be clearly identified.

Context of and specific resources for **9.3)**

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assessment

This unit should be assessed as it relates to normal work practice using procedures, information and resources typical of a workplace. This should include:

- OHS policy and work procedures and instructions.
- Suitable work environment, facilities, equipment and materials to undertake actual work as prescribed in this unit.

These should be used in the formal learning/assessment environment.

Note:

Where simulation is considered a suitable strategy for assessment, conditions for assessment must be authentic and as far as possible reproduce and replicate the workplace and be consistent with the approved industry simulation policy.

The resources used for assessment should reflect current industry practices in relation to compiling and producing an electrotechnology report.

Method of assessment **9.4)**

This unit shall be assessed by methods given in Volume 1, Part 3 ‘Assessment Guidelines’.

Note:

Competent performance with inherent safe working practices is expected in the Industry to which this unit applies. This requires that the specified essential knowledge and associated skills are assessed in a structured environment which is primarily intended for learning/assessment and incorporates all necessary equipment and facilities for learners to develop and demonstrate the essential knowledge and skills described in this unit.

Concurrent assessment and relationship with other units **9.5)**

There are no concurrent assessment recommendations for this unit.

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Range Statement

RANGE STATEMENT

10) This relates to the unit as a whole providing the range of contexts and conditions to which the performance criteria apply. It allows for different work environments and situations that will affect performance.

This unit shall be demonstrated in relation to writing reports in response to at least three of the following:

- an enquiry,
- a situation,
- an investigation,
- a problem or
- an incident

Each in relation to a different one of the following work activities:

- installation,
- fault finding/repair,
- servicing/maintenance or
- safety

Generic terms used throughout this Vocational Standard shall be regarded as part of the Range Statement in which competency is demonstrated. The definition of these and other terms that apply are given in Volume 2, Part 2.1.

Unit Sector(s)

Not applicable.

Competency Field

Competency Field **11)**

Electrotechnology

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UEENEEF102A Install and maintain cabling for multiple access to telecommunication services

Modification History

Not applicable.

Unit Descriptor

Unit Descriptor **1) Scope:**

1.1) Descriptor

This unit covers the installation and maintenance of telecommunications cabling in buildings and premises. It encompasses working safely and to Australian Communications and Media Authority's 'Open' Cabling Provider Rule, installing multiple telephone line, multi-pair cables, backbone cabling, terminating in socket outlets, termination modules and distributors, testing and compliance checks and completing cabling documentation.

Application of the Unit

Application of the Unit **2)**

This unit applies to customer cabling terminated on distributors and to the installation, maintenance and modification of indoor, external, underground cabling Customer cabling, for the purpose of this standard, may be used to connect devices for a range of applications, including for example: telecommunications (phones and facsimile), data including video and multimedia, security and alarms, and fire protection.

Licensing/Regulatory Information

License to practice **3)**

This unit meets the minimum ACMA 'prescribed level of

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License to practice **3)**

knowledge and skill that safeguards matters of health, safety, network integrity and addresses matters of interoperability where customer equipment and standard telephone service are involved'. Therefore, skills and knowledge described in this unit may only be practised under the requirements set out in ACMA 'Open' Cabling Provider Rule.

Practice of this competency standard unit is also subject to regulations directly related to occupational health and safe and contracts of training where they apply.

Note:

1. Compliance with permits may be required in various jurisdictions and typically relates to the operation of plant, machinery and equipment such as elevating work platforms, powder operated fixing tools, power operated tools, vehicles, road signage and traffic control and lifting equipment. Permits may also be required for some work environments such as confined spaces, working aloft, near live electrical apparatus and site rehabilitation.

2. Compliance may be required in various jurisdictions relating to currency in First Aid, confined space, lifting and risk safety measures.

Pre-Requisites

Prerequisite Unit(s) **4)**

Competencies **4.1)**

Granting competency in this unit shall be made only after competency in the following unit(s) has/have been confirmed.

UEENEEE101A	Apply Occupational Health and Safety regulations, codes and practices in the workplace
UEENEEE102A	Fabricate, assemble and dismantle utilities industry components
UEENEEE104A	Solve problems in d.c. circuits

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Prerequisite Unit(s) **4)**

UEENEEE105A	Fix and secure electrotechnology equipment
UEENEEE107A	Use drawings, diagrams, schedules, standards, codes and specifications

Literacy and numeracy skills **4.2)**

Participants are best equipped to achieve competency in this unit if they have reading, writing and numeracy skills indicated by the following scales. Description of each scale is given in Volume 2, Part 3 'Literacy and Numeracy'

Reading 3 Writing 3 Numeracy 3

Employability Skills Information

Employability Skills **5)**

The required outcomes described in this unit of competency contain applicable facets of Employability Skills. The Employability Skills Summary of the qualification in which this unit of competency is packaged will assist in identifying Employability Skill requirements.

Elements and Performance Criteria Pre-Content

6) Elements describe the essential outcomes of a competency standard unit	Performance Criteria describe the required performance needed to demonstrate achievement of the element. Assessment of performance is to be consistent with the Evidence Guide.

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Elements and Performance Criteria

ELEMENT	PERFORMANCE CRITERIA
1 Prepare to install and maintain cabling.	1.1 OHS procedures for a given work area are identified, obtained and understood through established routines and procedures.
	1.2 Health and safety risks are identified and established risk control measures and procedures are followed in preparation for the work.
	1.3 Remote power feeding is identified and established risk control measures prepared.
	1.4 The nature and location of the work is determined from documentation or in discussion with appropriate person(s) to establish the scope of work to be undertaken.
	1.5 Cable routes are planned within the constraints of the building structure, significants and regulations.
	1.6 Earthing requirements are determined with consideration of existing earthing arrangements, where applicable and of cable system earth upper and lower resistance limitations.
	1.7 Advice is sought from appropriate persons to ensure the work is coordinated effectively with others.
	1.8 Sources of materials that may be required for the work are established in accordance with established routines and procedures.
	1.9 Tools, equipment and testing devices needed to carry out the work are obtained and checked for correct operation and safety.
2 Install and maintain cabling.	2.1 Established OHS risk control measures and procedures for carrying out the work are followed.
	2.2 Installed support structure is checked to ensure cable will not be exposed to damage during installation and general operation.
	2.3 Catenary supports are secured to building structure and tensioned where necessary to ensure cable weight can be carried in operating conditions with interference and safety segregation maintained including adherence to

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ELEMENT	PERFORMANCE CRITERIA	
		AS/ACIF S009.
	2.4	Protective earthing of metal work is installed in accordance with requirements and to industry standards.
	2.5	Cables/wires are handled in accordance with manufacturer's application specifications including tension and bending stress requirements.
	2.6	Sufficient excess is allowed at cable ends to facilitate termination.
	2.7	Telecommunication outlet ends of cable are uniquely labelled to match identifier at originating location.
	2.8	Cable is placed and secured to maintain safety and interference segregation in accordance with legislative and industry standards.
	2.9	Cable ties not tightened to the point of causing cable sheath damage or transmission impairment are trimmed flush to prevent risk of personal damage.
	2.10	Cables installed as catenaries or supported by catenaries in external environment shall meet minimum above ground clearances and clearances from hazardous electrical services as per AS/ACIF S009.
	2.11	Cables installed underground shall meet minimum depth of cover and segregation from hazardous electrical and other services as per AS/ACIF S009.
	2.12	Over-voltage protection devices are fitted to all cable pairs, where required, to suppress voltage surges with the devices protectively earthed in accordance with AS/ACIF S009.
	2.13	TRC/CES/Earth wire insulation is protected against damage and TRC/CES and protective earths segregated in accordance with relevant industry and legislative standards AS/ACIF S009.
	2.14	Procedures for referring non-routine events to immediate supervisor for directions are followed.

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ELEMENT	PERFORMANCE CRITERIA	
	2.15	Cabling is installed efficiently without waste of materials and energy or damage to apparatus, the surrounding environment or services.
	2.16	Routine quality checks are carried out to ensure cabling complies with requirements.
3. Terminate and test cables and earth wires.	3.1	Established OHS risk control measures and procedures for carrying out the work are followed.
	3.2	Cable sheath removed to allow for correct termination length and without damage to underlying conductors and their insulation.
	3.3	Terminating modules are installed in accordance to manufacturer specifications and cable pairs neatly and sequentially fanned for termination.
	3.4	Conductors are terminated in accordance with recommended colour code sequence using appropriate termination tools in the manufacturer's specified manner.
	3.5	Cable shield (if applicable) is earthed to manufacturer specifications and relevant industry codes of practice including AS/ACIF S009.
	3.6	Visual inspection is undertaken to confirm termination colour code sequence has been followed prior to end-to-end testing of wire and pair termination integrity.
	3.7	Cable pairs are tested and clearly labelled to provide an accurate identification in accordance with requirements.
	3.8	TRC/CES/Earth wires are terminated with connectors recommended by manufacturers in accordance with relevant industry codes of practice including AS/ACIF S009.
	3.9	TRC/CES /Earth wire continuity is maintained through out and interface requirements with electrical systems are observed.
	3.10	TRC/CES /Earthing installation is tested for continuity, insulation resistance and conductive

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ELEMENT	PERFORMANCE CRITERIA	
		resistance as per relevant industry standards including AS/ACIF S009.
	3.11	Earthing system is labelled in accordance with requirements.
	3.12	Compatibility of alterations with existing systems is confirmed and new work tested both in isolation and when integrated with existing systems.
	3.13	Procedures for referring non-routine events to immediate supervisor for directions are followed.
	3.14	Cabling is terminated efficiently without waste of materials and energy or damage to apparatus, the surrounding environment or services.
	3.15	Routine quality checks are carried out and a defect rectified to ensure cabling complies with requirements.
4 Complete cabling work, records and reporting.	4.1	OHS work completion risk control measures and procedures are followed.
	4.2	Work site is cleaned and made safe in accordance with established procedures.
	4.3	Record sheets and plans of cable location, type and infrastructure are accurately created or updated and stored in accordance with customer requirements.
	4.4	Cable pair record books are created or updated to provide an accurate record of pair locations, inter-connections and usage in accordance with industry codes of practice and AS/ACIF S009.
	4.5	Cabling completion advice is documented and reported in accordance with requirements.

Required Skills and Knowledge

REQUIRED SKILLS AND KNOWLEDGE

8) This describes the essential skills and knowledge and their level, required for this unit.

Evidence shall show that knowledge has been acquired of safe working practices and

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REQUIRED SKILLS AND KNOWLEDGE

laying and connecting cables for multiple access to telecommunication services.

All knowledge and skills detailed in this unit should be contextualised to current industry practices and technologies.

KS01-EF102A Telecommunications telephony and switching

Evidence shall show an understanding of telecommunications telephony and switching, applying safe working practices and relevant Standards, Codes and Regulations to an extent indicated by the following aspects:

T1. Principles and characteristics of sound encompassing:

- Sound characteristics
- Sound waves
- Distortion
- Attenuation
- Resonant frequency
- Sound pressure levels

T2. Transmission of sound encompassing:

- Compression
- Rarefaction
- Sound transmission
- Wavelength
- Inverse square rule (attenuation)
- Basic telephone construction

T3. Telephone transmitters encompassing:

- Telephone transmitter functions
- Telephone transmitter types
- Capacitive transmitters
- Moving coil transmitters

T4. Telephone receivers encompassing:

- Telephone receiver functions
- Telephone receiver types

T5. Telephone circuits encompassing:

- Components
- Operation of basic telephone
- Operation of basic facsimile machine
- Cables used, colour and termination types

T6. Overview of earthing and protection encompassing:

- Function of earthing
- Earthing requirements

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REQUIRED SKILLS AND KNOWLEDGE

T7. Customer switching systems (CSS), interfaces and devices encompassing:

- System Distribution Frames (SDF)
- Power fail and line interface requirements (e.g. Indial, ISDN, Rotary Groups, Extension, Tie-line circuits and the like)

T8. Installation of CSS encompassing:

- Documentation
- CPR rules
- CSS interfaces
- CPR rules for SDFs

T9. Installation and termination requirements overview encompassing:

- ACMA regulations and requirements
- Technical standards
- Programming of CSS
- Metering and Public/Pay Phones

T10. Hazards encompassing:

- Electronic components and circuits
- Printed circuit boards
- Physical
- Static discharge
- Chemical

KS02-EF102A Telecommunications Open CPR regulations

Evidence shall show an understanding of telecommunications Open CPR regulations, applying safe working practices and relevant Standards, Codes and Regulations to an extent indicated by the following aspects:

T1 Cabling provider rules encompassing:

- Cabling registrars, auditors and inspectors
- Mandatory and voluntary requirements for cabling work
- Registration

T2 General installation requirements encompassing:

- Cabling provider rules requirements
- Earth potential rise
- Catenary cabling systems
- Optical fibre and coaxial cabling systems
- Conduits
- Surge suppression devices
- T3 Cable distribution devices encompassing:
- Cable distribution devices

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REQUIRED SKILLS AND KNOWLEDGE

- Clearances
- General requirement
- T4 Indoor cabling encompassing:
- General requirements for indoor cabling
- Required minimum clearances
- Damp situations
- Cables in lift and hoist shafts
- T5 Underground cabling encompassing:
- Requirements for underground cabling
- Protection of underground cabling
- Segregation from other services
- T6 Aerial cabling encompassing:
- Requirements for aerial cabling
- Minimum clearances
- Segregation requirements
- T7 Earthing encompassing:
- Earthing systems
- Earthing of equipment
- Equipotential bonding
- T8 Miscellaneous regulations encompassing:
- Cabling in heritage buildings
- Cabling in public places
- Cabling in hazardous areas

KS03-EF102A Telecommunications installation practices

Evidence shall show an understanding of telecommunications installation and maintenance practices, applying safe working practices and relevant Standards, Codes and Regulations to an extent indicated by the following aspects:

T1 Telecommunication cable types encompassing:

- Construction
- Characteristics
- Applications

T2 Cable identification encompassing:

- Plans and drawing
- Labelling
- Documentation

T3 Building structures, materials and sequencing encompassing:

- Building types
- Timber frame
- Brick veneer

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REQUIRED SKILLS AND KNOWLEDGE

- Double brick
- Metal frame
- Parts of a building
- Sequence of construction
- Stages of construction where electrical work is completed
- Environmental and heritage awareness purpose and regulations

T4 Cable installation encompassing:

- Hazards
- Cable damage prevention
- Cable dispensers
- Cable enclosures
- Types
- Fixing
- Regulations
- Distribution boxes and back mounts
- Systems

T5 Termination Boundaries and devices encompassing:

- Electrical connections
- Hazards
- Regulations

T6 Cable preparation and terminations and hauling mechanisms encompassing:

- Indoor Methods
- Outdoor Methods

T7 Earthing concepts encompassing:

- MEN System
- Communication Earthing System
- Telecommunication Reference Conductor
- Earthing Cable Shield
- Testing
- Earth Barriers
- Purpose of earth testing instruments
- Earth Potential Rise
- Earthing test procedures
- Interpretation of results

T8 Surge suppression and system encompassing:

- Purpose
- Types
- Operation

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REQUIRED SKILLS AND KNOWLEDGE

- Installation Techniques
- Earthing requirements

T9 Cable shielding and interference encompassing:

- EMI/RFI Principles
- Sources
- Reduction Techniques
- Earthing Cable Shields

T10 Telecommunication earthing systems encompassing:

- Hazards
- Solutions
- Installation
- Termination
- Line taps
- Testing

Evidence Guide

EVIDENCE GUIDE

9) This provides essential advice for assessment of the unit and must be read in conjunction with the performance criteria and the range statement of the unit and the Training Package Assessment Guidelines.

The Evidence Guide forms an integral part of this unit. It must be used in conjunction with all parts of the unit and performed in accordance with the Assessment Guidelines of this Training Package.

Overview of Assessment **9.1)**

Longitudinal competency development approaches to assessment, such as Profiling, require data to be reliably gathered in a form that can be consistently interpreted over time. This approach is best utilised in Apprenticeship programs and reduces assessment intervention. It is the industry-preferred model for apprenticeships. However, where summative (or final) assessment is used it is to include the application of the competency in the normal work environment or, at a minimum, the application of the competency in a realistically simulated work environment. It is recognised that, in some circumstances, assessment in part or full can occur outside

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the workplace. However, it must be in accordance with industry and regulatory policy.

Methods chosen for a particular assessment will be influenced by various factors. These include the extent of the assessment, the most effective locations for the assessment activities to take place, access to physical resources, additional safety measures that may be required and the critical nature of the competencies being assessed.

The critical safety nature of working with electricity, electrical equipment, gas or any other hazardous substance/material carries risk in deeming a person competent. Sources of evidence need to be 'rich' in nature to minimise error in judgment.

Activities associated with normal everyday work have a bearing on the decision as to how much and how detailed the data gathered will contribute to its 'richness'. Some skills are more critical to safety and operational requirements while the same skills may be more or less frequently practised. These points are raised for the assessors to consider when choosing an assessment method and developing assessment instruments. Sample assessment instruments are included for Assessors in the Assessment Guidelines of this Training Package.

Critical aspects of evidence required to demonstrate competency in this unit

9.2)

Before the critical aspects of evidence are considered all prerequisites shall be met.

Evidence for competence in this unit shall be considered holistically. Each element and associated performance criteria shall be demonstrated on at least two occasions in accordance with the 'Assessment Guidelines – UEE11'. Evidence shall also comprise:

- A representative body of work performance demonstrated within the timeframes typically expected of the discipline, work function and industrial environment. In particular this shall incorporate evidence that shows a candidate is able to:
  - Implement Occupational Health and Safety workplace procedures and practices, including the use of risk control measures as specified in the performance criteria and range statement

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- Apply sustainable energy principles and practices as specified in the performance criteria and range statement
- Demonstrate an understanding of the essential knowledge and associated skills as described in this unit. It may be required by some jurisdictions that RTOs provide a percentile graded result for the purpose of regulatory or licensing requirements.
- Demonstrate an appropriate level of skills enabling employment
- Conduct work observing the relevant Anti Discrimination legislation, regulations, polices and workplace procedures

- Demonstrated consistent performance across a representative range of contexts from the prescribed items below:
  - Lay and connect cables for multiple access to telecommunication services as described in 8) and including:

A	Terminating systems at both distributor and outlet locations and at least one 50 pair copper cable, with accurate completion of installation records, drawing alterations and compliance forms
B	Placing of cables on support structures and building faces for both internal and external locations
C	Securing cables correctly for above locations
D	Avoiding cable damage such as crushing, burning, kinking, sheath twist, cutting and nicking, bending radius
E	Reading and interpreting drawings related to cable layouts, outlet location, cable coding system and identifiers, distributor locations
F	Conducting and interpreting cable test results
G	Correctly interpreting and applying standards and regulations
H	Completing the required documentation
I	Dealing with unplanned events by drawing on essential knowledge and skills to provide appropriate solutions incorporated in a holistic assessment with the above listed items

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Context of and specific resources for assessment

9.3)

This unit should be assessed as it relates to normal work practice using procedures, information and resources typical of a workplace. This should include:

- OHS policy and work procedures and instructions.
- Suitable work environment, facilities, equipment and materials to undertake actual work as prescribed by this unit.

These should be used in the formal learning/assessment environment.

Note:

Where simulation is considered a suitable strategy for assessment, conditions must be authentic and as far as possible reproduce and replicate the workplace and be consistent with the approved industry simulation policy.

The resources used for assessment should reflect current industry practices in relation to laying and connecting cables for multiple access to telecommunication services.

Method of assessment

9.4)

This unit shall be assessed by methods given in Volume 1, Part 3 ‘Assessment Guidelines’.

Note:

Competent performance with inherent safe working practices is expected in the Industry to which this competency standard unit applies. This requires assessment in a structured environment which is primarily intended for learning/assessment and incorporates all necessary equipment and facilities for learners to develop and demonstrate the essential knowledge and skills described in this unit.

Concurrent assessment and relationship with other units

9.5)

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For optimisation of training and assessment effort, competency development in this unit may be arranged concurrently with unit:

UEENEEE105A	Fix and secure electrotechnology equipment
UEENEEE107A	Use drawings, diagrams, schedules, standards, codes and specifications

Range Statement

RANGE STATEMENT

10) This relates to the unit as a whole providing the range of contexts and conditions to which the performance criteria apply. It allows for different work environments and situations that will affect performance.

This unit shall be demonstrated in relation to cable laying and connecting applicable to larger commercial and industry installations involving many lines, multi-pair cables, backbone cabling, multi-story buildings and more complicated termination modules and distributors.

Generic terms used throughout this Vocational Standard shall be regarded as part of the Range Statement in which competency is demonstrated. The definition of these and other terms that apply are given in Volume 2, Part 2.1.

Unit Sector(s)

Not applicable.

Competency Field

Competency Field **11)**

Data and Voice Communications

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UEENEEF104A Install and modify performance data communication copper cabling

Modification History

Not applicable.

Unit Descriptor

Unit Descriptor **1) Scope:**

1.1) Descriptor

This unit covers the installation and termination of high performance data copper cabling in buildings and premises and intended for connection a telecommunications network. It encompasses working safely and to standards, installing multiple data lines and backbones using structured twisted pair cabling, terminating at distributors, termination modules and in socket outlets, testing and compliance checks and completing cabling documentation.

Application of the Unit

Application of the Unit **2)**

This unit is intended for competency development in entry-level employment based programs incorporated in approved contracts of training.

Licensing/Regulatory Information

License to practice **3)**

The skills and knowledge described in this unit require a registration to practise in the workplace subject to requirements set out ACMA 'Open' Cabling Provider Rule. Practice in workplace and during training is also subject to regulations directly related to occupational health and safety and where applicable contracts of

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License to practice **3)**

training such as apprenticeships.

Note:

1. Compliance with permits may be required in various jurisdictions and typically relates to the operation of plant, machinery and equipment such as elevating work platforms, powder operated fixing tools, power operated tools, vehicles, road signage and traffic control and lifting equipment. Permits may also be required for some work environments such as confined spaces, working aloft, near live electrical apparatus and site rehabilitation.

2. Compliance may be required in various jurisdictions relating to currency in First Aid, confined space, lifting and risk safety measures.

Pre-Requisites

Prerequisite Unit(s) **4)**

Competencies **4.1)**

Granting competency in this unit shall be made only after competency in the following unit(s) has/have been confirmed.

UEENEEE101A	Apply Occupational Health and Safety regulations, codes and practices in the workplace
UEENEEE102A	Fabricate, assemble and dismantle utilities industry components
UEENEEE104A	Solve problems in d.c. circuits
UEENEEE105A	Fix and secure electrotechnology equipment
UEENEEE107A	Use drawings, diagrams, schedules, standards, codes and specifications
UEENEEF102A	Install and maintain cabling for multiple access to telecommunication services

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Literacy and numeracy skills **4.2)**

Participants are best equipped to achieve competency in this unit if they have reading, writing and numeracy skills indicated by the following scales. Description of each scale is given in Volume 2, Part 3 'Literacy and Numeracy'

Reading 3 Writing 3 Numeracy 3

Employability Skills Information

Employability Skills **5)**

The required outcomes described in this unit of competency contain applicable facets of Employability Skills. The Employability Skills Summary of the qualification in which this unit of competency is packaged will assist in identifying Employability Skill requirements.

Elements and Performance Criteria Pre-Content

6) Elements describe the essential outcomes of a competency standard unit

Performance Criteria describe the required performance needed to demonstrate achievement of the element. Assessment of performance is to be consistent with the Evidence Guide.

Elements and Performance Criteria

ELEMENT	PERFORMANCE CRITERIA
1 Prepare to install and/or modify copper cabling.	1.1 OHS procedures for a given work area are identified, obtained and understood.
	1.2 Health and safety risks are identified and established risk control measures and procedures are followed in preparation for the work.

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ELEMENT	PERFORMANCE CRITERIA	
	1.3	Safety hazards that have not previously been identified are noted and established risk control measures are implemented.
	1.4	Installation or modification of wiring is prepared in consultation with others affected by the work and sequenced appropriately.
	1.5	The nature and location of the work is determined from documentation or in discussion with appropriate person(s) to establish the scope of work to be undertaken.
	1.6	Cable routes are planned within the constraints of the building structure, fire walls, cultural/heritage requirements and regulations.
	1.7	Advice is sought from appropriate persons to ensure the work is coordinated effectively with others.
	1.8	Material needed for the installation work is obtained in accordance with established procedures and checked against job requirements.
	1.9	Tools, equipment and testing devices needed to for the installation work are obtained in accordance with established procedures and checked for correct operation and safety.
	1.10	Preparatory work is checked to ensure no damage has occurred and that it complies with requirements.
2 Install copper cables or modify.	2.1	OHS risk control measures and procedures for carrying out the work are followed.
	2.2	Cables are installed or modification to comply with manufacturer specifications, technical standards and job requirements with sufficient excess to affect terminations.
	2.3	Established methods for dealing with unexpected situations are discussed with appropriate person(s) and documented.

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ELEMENT	PERFORMANCE CRITERIA	
	2.4	Unexpected situations are dealt with safely and with the approval of an authorised person.
	2.5	Ongoing checks of the quality of installed or modified wiring are undertaken in accordance with established procedures.
	2.6	Cable installation/modification is carried out efficiently without waste of materials or damage to apparatus, circuits or the surrounding environment and using sustainable energy practices.
3 Terminate copper cables.	3.1	OHS risk control measures and procedures for carrying out the work are followed.
	3.2	Cable termination work area is cleaned and safety measure implemented.
	3.3	Cables are prepared for termination in accordance with manufacturer specifications and technical standards.
	3.4	Over voltage protection devices are fitted to cables with metallic components.
	3.5	Cable shields are earthed in accordance with manufacturer specifications and technical standards.
	3.6	Twist ratio of structured metallic cables is maintained in accordance with manufacturer specifications and technical standards.
	3.7	Twisted pair cables are terminated in accordance with manufacturer specifications and technical standards.
	3.8	Cable performance tests are conducted accurately and results documented.
	3.9	Causes of defects indicated by test results are identified and rectified.
	3.10	Unexpected situations are dealt with safely and with the approval of an authorised person.

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ELEMENT	PERFORMANCE CRITERIA	
	3.11	Ongoing checks of the quality of installed wiring are undertaken in accordance with established procedures.
	3.12	Cable terminations are carried out efficiently without waste of materials or damage to apparatus, circuits or the surrounding environment and using sustainable energy practices.
4 Document and verify copper cabling installation and performance.	4.1	OHS work completion risk control measures and procedures are followed.
	4.2	Work site is cleaned and made safe in accordance with established procedures.
	4.3	Final checks are made to that the installed cabling conforms to requirements.
	4.4	Documentation certifying system performance is issued to an appropriate person(s).

Required Skills and Knowledge

REQUIRED SKILLS AND KNOWLEDGE

8) This describes the essential skills and knowledge and their level, required for this unit.

Evidence shall show that knowledge has been acquired of safe working practices and installing and modifying performance data communication structured cabling.

All knowledge and skills detailed in this unit should be contextualised to current industry practices and technologies.

KS01-EF104A Copper communication cable installation and modification practices

Evidence shall show an understanding of copper communication cable installation and modification practices, applying safe working practices and relevant Standards, Codes and Regulations to an extent indicated by the following aspects:

T1. Telecommunication cable types

- construction
- characteristics and
- applications

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REQUIRED SKILLS AND KNOWLEDGE

T2. Cable identification

- plans and drawing
- labelling
- documentation

T3. Cable installation

- Hazards
- Cable damage prevention
- Cable dispensers

T4. Building construction

- Domestic buildings
- Commercial buildings

T5. Fixing devices

- Bracketed assemblies
- Hard wall fixing devices
- Soft wall fixing devices
- Ties

T6. Cable enclosures

- Types
- Fixing
- Regulations

T7. Distribution boxes and back mounts

- Systems
- Termination Boundaries and devices

T8. Electrical connections

- Hazards
- Regulations

T9. Cable preparation and terminations and hauling mechanisms

- Indoor Methods
- Outdoor Methods

T10. Category 5 and 6 structured cabling

- design principles

T11. Category 5 and 6 structured cabling installation systems

- coaxial cable construction
- uses
- requirements

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REQUIRED SKILLS AND KNOWLEDGE

T12. Category 5 and 6 structured cabling performance requirements

- approved practices
- safety requirements
- connectors
- terminating tools
- continuity tests
- fault diagnosis
- recording results

T13. Selecting cable and cabling hardware

- cable characteristics
- higher performance cable types
- requirements of Australian Standards

T14. Testing Category 5 and 6 cabling

- Testing

T15. Local area network cabling systems

T16. Coaxial cables

- Coaxial cables
- Coaxial cable installation systems
- Twisted pair cable installation systems

Evidence Guide

EVIDENCE GUIDE

9) This provides essential advice for assessment of the unit and must be read in conjunction with the performance criteria and the range statement of the unit and the Training Package Assessment Guidelines.

The Evidence Guide forms an integral part of this unit. It must be used in conjunction with all parts of the unit and performed in accordance with the Assessment Guidelines of this Training Package.

Overview of Assessment **9.1)**

Longitudinal competency development approaches to assessment, such as Profiling, require data to be reliably gathered in a form that can be consistently interpreted over time. This approach is best

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utilised in Apprenticeship programs and reduces assessment intervention. It is the industry-preferred model for apprenticeships. However, where summative (or final) assessment is used it is to include the application of the competency in the normal work environment or, at a minimum, the application of the competency in a realistically simulated work environment. It is recognised that, in some circumstances, assessment in part or full can occur outside the workplace. However, it must be in accordance with industry and regulatory policy.

Methods chosen for a particular assessment will be influenced by various factors. These include the extent of the assessment, the most effective locations for the assessment activities to take place, access to physical resources, additional safety measures that may be required and the critical nature of the competencies being assessed.

The critical safety nature of working with electricity, electrical equipment, gas or any other hazardous substance/material carries risk in deeming a person competent. Sources of evidence need to be 'rich' in nature to minimise error in judgment.

Activities associated with normal everyday work have a bearing on the decision as to how much and how detailed the data gathered will contribute to its 'richness'. Some skills are more critical to safety and operational requirements while the same skills may be more or less frequently practised. These points are raised for the assessors to consider when choosing an assessment method and developing assessment instruments. Sample assessment instruments are included for Assessors in the Assessment Guidelines of this Training Package.

Critical aspects of evidence required to demonstrate competency in this unit

9.2)

Before the critical aspects of evidence are considered all prerequisites shall be met.

Evidence for competence in this unit shall be considered holistically. Each element and associated performance criteria shall be demonstrated on at least two occasions in accordance with the 'Assessment Guidelines – UEE11'. Evidence shall also comprise:

- A representative body of work performance demonstrated

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within the timeframes typically expected of the discipline, work function and industrial environment. In particular this shall incorporate evidence that shows a candidate is able to:

- Implement Occupational Health and Safety workplace procedures and practices, including the use of risk control measures as specified in the performance criteria and range statement
- Apply sustainable energy principles and practices as specified in the performance criteria and range statement
- Demonstrate an understanding of the essential knowledge and associated skills as described in this unit. It may be required by some jurisdictions that RTOs provide a percentile graded result for the purpose of regulatory or licensing requirements.
- Demonstrate an appropriate level of skills enabling employment
- Conduct work observing the relevant Anti Discrimination legislation, regulations, polices and workplace procedures

- Demonstrated consistent performance across a representative range of contexts from the prescribed items below:
  - Install and modify performance data communication structured cabling as described in 8) and including:

A Reading and interpreting drawings related to cable layouts, cable schedules and apparatus locations.

B Routing, placing and securing cables to comply with requirements

C Maintaining fire integrity

D Preparing and terminating each type of cable to comply with requirements.

E Conducting cable performance test accurately

F Identifying and rectifying anomalies

G Completing the necessary documentation accurately.

H Dealing with unplanned events by drawing on essential knowledge and skills to provide appropriate solutions incorporated in a holistic assessment with the above listed items.

Note:

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Successful completion of relevant vendor training may be used to contribute to evidence on which competency is deemed. In these cases the alignment of outcomes of vendor training with performance criteria and critical aspects of evidence shall be clearly identified.

Context of and specific resources for assessment

9.3)

This unit should be assessed as it relates to normal work practice using procedures, information and resources typical of a workplace. This should include:

- OHS policy and work procedures and instructions.
- Suitable work environment, facilities, equipment and materials to undertake actual work as prescribed by this unit.

These should be used in the formal learning/assessment environment.

Note:

Where simulation is considered a suitable strategy for assessment, conditions must be authentic and as far as possible reproduce and replicate the workplace and be consistent with the approved industry simulation policy.

The resources used for assessment should reflect current industry practices in relation to installing and modifying performance data communication structured cabling.

Method of assessment

9.4)

This unit shall be assessed by methods given in Volume 1, Part 3 ‘Assessment Guidelines’.

Note:

Competent performance with inherent safe working practices is expected in the Industry to which this competency standard unit applies. This requires assessment in a structured environment which is primarily intended for learning/assessment and incorporates all necessary equipment and facilities for learners to develop and demonstrate the essential knowledge and skills described in this unit.

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Concurrent assessment and relationship with other units **9.5)**

For optimisation of training and assessment effort, competency development in this unit may be arranged concurrently with unit:

UEENEEF109A	Install and connect data and voice communication equipment

Range Statement

RANGE STATEMENT

10) This relates to the unit as a whole providing the range of contexts and conditions to which the performance criteria apply. It allows for different work environments and situations that will affect performance.

This unit shall be demonstrated in relation to installing and modifying performance structured metallic cables each on at least two occasions.

Generic terms used throughout this Vocational Standard shall be regarded as part of the Range Statement in which competency is demonstrated. The definition of these and other terms that apply are given in Volume 2, Part 2.1.

Unit Sector(s)

Not applicable.

Competency Field

Competency Field **11)**

Data and Voice Communications

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UEENEEF105A Install and modify optical fibre performance data communication cabling

Modification History

Not applicable.

Unit Descriptor

Unit Descriptor **1) Scope:**

1.1) Descriptor

This unit covers the installation and modification of high performance data communication optical fibre cabling in buildings and premises and intended for connection a telecommunications network. It encompasses working safely and to standards, installing multiple data lines and backbones using optical fibre cabling, terminating at distributors, splices and on socket outlets, testing and compliance checks and completing cabling documentation.

Application of the Unit

Application of the Unit **2)**

This unit is intended for competency development in entry-level employment based programs incorporated in approved contracts of training.

Licensing/Regulatory Information

License to practice **3)**

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License to practice **3)**

The skills and knowledge described in this unit require a registration to practise in the workplace subject to requirements set out ACMA 'Open' Cabling Provider Rule. Practice in workplace and during training is also subject to regulations directly related to occupational health and safety and where applicable contracts of training such as apprenticeships.

Note:
1. Compliance with permits may be required in various jurisdictions and typically relates to the operation of plant, machinery and equipment such as elevating work platforms, powder operated fixing tools, power operated tools, vehicles, road signage and traffic control and lifting equipment. Permits may also be required for some work environments such as confined spaces, working aloft, near live electrical apparatus and site rehabilitation.
2. Compliance may be required in various jurisdictions relating to currency in First Aid, confined space, lifting and risk safety measures.

Pre-Requisites

Prerequisite Unit(s) **4)**

Competencies **4.1)**

Granting competency in this unit shall be made only after competency in the following unit(s) has/have been confirmed.

UEENEEE101A	Apply Occupational Health and Safety regulations, codes and practices in the workplace
UEENEEE102A	Fabricate, assemble and dismantle utilities industry components
UEENEEE104A	Solve problems in d.c. circuits
UEENEEE105A	Fix and secure electrotechnology equipment
UEENEEE1	Use drawings, diagrams, schedules,

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Prerequisite Unit(s) **4)**

07A	standards, codes and specifications
UEENEEF102A	Install and maintain cabling for multiple access to telecommunication services

Literacy and numeracy skills **4.2)**

Participants are best equipped to achieve competency in this unit if they have reading, writing and numeracy skills indicated by the following scales. Description of each scale is given in Volume 2, Part 3 ‘Literacy and Numeracy’

Reading	3	Writing	3	Numeracy	3

Employability Skills Information

Employability Skills **5)**

The required outcomes described in this unit of competency contain applicable facets of Employability Skills. The Employability Skills Summary of the qualification in which this unit of competency is packaged will assist in identifying Employability Skill requirements.

Elements and Performance Criteria Pre-Content

6) Elements describe the essential outcomes of a competency standard unit	Performance Criteria describe the required performance needed to demonstrate achievement of the element. Assessment of performance is to be consistent with the Evidence Guide.

Elements and Performance Criteria

ELEMENT	PERFORMANCE CRITERIA

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ELEMENT		PERFORMANCE CRITERIA	
1	Prepare to install or modify optical fibre cabling	1.1	OHS procedures for a given work area are identified, obtained and understood.
		1.2	Health and safety risks are identified and established risk control measures and procedures are followed in preparation for the work.
		1.3	Safety hazards that have not previously been identified are noted and established risk control measures are implemented.
		1.4	Installation or modification of wiring is prepared in consultation with others affected by the work and sequenced appropriately.
		1.5	The nature and location of the work is determined from documentation or in discussion with appropriate person(s) to establish the scope of work to be undertaken.
		1.6	Advice is sought from appropriate persons to ensure the work is coordinated effectively with others.
		1.7	Material needed for the installation work is obtained in accordance with established procedures and checked against job requirements.
		1.8	Tools, equipment and testing devices needed to for the installation work are obtained in accordance with established procedures and checked for correct operation and safety.
		1.9	Preparatory work is checked to ensure no damage has occurred and that it complies with requirements.
2	Install or modify optical fibre cables	2.1	OHS risk control measures and procedures for carrying out the work are followed.
		2.2	Optical fibres are tested for optical continuity.
		2.2	Cables are installed or modification to comply with manufacturer specifications, technical standards and job requirements with sufficient excess to affect terminations.
		2.4	Established methods for dealing with unexpected situations are discussed with appropriate person(s) and documented.

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ELEMENT	PERFORMANCE CRITERIA	
	2.5	Unexpected situations are dealt with safely and with the approval of an authorised person.
	2.6	Ongoing checks of the quality of installed wiring are undertaken in accordance with established procedures.
	2.7	Cable installation/modification is carried out efficiently without waste of materials or damage to apparatus, circuits or the surrounding environment and using sustainable energy practices.
3 Terminate optical fibre cables.	3.1	OHS risk control measures and procedures for carrying out the work are followed.
	3.2	Cable termination work area is cleaned and safety measure implemented, particularly for terminating optical fibre cables.
	3.3	Cables are prepared for termination in accordance with manufacturer specifications and technical standards.
	3.4	Optical fibre connectors are fitted in accordance with manufacturer specifications and technical standards.
	3.5	Appropriate methods are used to splice optical fibre cables in strict accordance with OHS safety measures, manufacturer specifications and technical standards.
	3.6	Cable performance tests are conducted accurately and results documented.
	3.7	Causes of defects indicated by test results are identified and rectified.
	3.8	Unexpected situations are dealt with safely and with the approval of an authorised person.
	3.9	Ongoing checks of the quality of installed wiring are undertaken in accordance with established procedures.
	3.10	Cable terminations are carried out efficiently without waste of materials or damage to apparatus, circuits or the surrounding environment and using sustainable energy practices.
4 Document installation or modification, and verify	4.1	OHS work completion risk control measures and procedures are followed.

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ELEMENT	PERFORMANCE CRITERIA	
data communication optical fibre cabling performance.	4.2	Work site is cleaned and made safe in accordance with established procedures.
	4.3	Final checks are made to that the installed cabling conforms to requirements.
	4.4	Documentation certifying system performance is issued to an appropriate person(s).

Required Skills and Knowledge

REQUIRED SKILLS AND KNOWLEDGE

8) This describes the essential skills and knowledge and their level, required for this unit.

Evidence shall show that knowledge has been acquired of safe working practices and installing and modifying performance data communication optical fibre cabling.

All knowledge and skills detailed in this unit should be contextualised to current industry practices and technologies..

KS01-EF105A Optical fibre cable installation and modification practices

Evidence shall show an understanding of optical fibre communication cable installation and modification practices, applying safe working practices and relevant Standards, Codes and Regulations to an extent indicated by the following aspects:

T1. Telecommunications Standards and Regulations

- Telecommunications Wiring Rules AS/ACIF S009 or its replacement.
- Telecommunications Equipment Standards AS/ACIF S008 or its replacement.
- Cabling Provider Rules.

T2. Risk Management Principles with respect to:

- laser and similar products.
- optical fibre products.
- low voltage and extra low voltage circuits.
- working in hazardous areas.

T3. Optical Fibre Safety - Laser

- AS/NZS 2211.1 Safety of laser products
- AS/NZS 2211.2 Safety of optical fibre communications systems (OFCS)
- Nature of intense light outside of the visible light spectrum.

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REQUIRED SKILLS AND KNOWLEDGE

- Safety precautions to be employed when working with intense light sources.
- Laser classifications and their typical uses

T4. 4. Optical Fibre Safety - Hazards

- Chemicals used in the installation and termination process including Isopropyl Alcohol, Acetone, Kerosene, Mineral Turpentine and other solvents.
- Epoxy resins and other adhesives.
- Hot surface precautions.
- Disposal of hazardous materials including sharps (syringes glass shards and the like).
- Working in confined spaces and at height.

T5. Optical Theory

- Electromagnetic Spectrum and the place of visible light, infrared and ultra violet bands.
- Frequency of oscillation and the relationship to wavelength of light.
- Propagation speed and the refractive index.
- Reflection of light and refraction of light.

T6. Optical Fibre Principles of Operation

- Multi Mode Optical Fibres (MMOF)
- Single Mode Optical Fibres (SMOF)
- Advantages and applications
- Refractive index and how it can be employed in optical fibres.
- Transmission path for laser energy within the optical fibre.
- Optical fibre performance and the mechanisms that may result in losses.
- Requirements of optical fibre cables as specified in current Standards

T7. Installation of Cables

- Requirements of the standard AS/ACIF S009 or its replacement.
- AS/NZS 3080 or its replacement.
- Installation requirements of cables by the manufacturer.
- Building Codes of Australia.
- Construction of domestic, commercial and industrial buildings.
- Purpose and procedures for pre-testing optical fibre cable prior to installation
- Bending radii and hauling requirements.
- Cable supporting structures, cable trays and catenaries
- Types of securing devices and anchors.
- Safety precautions

T8. Terminating Fibre Cables

- Precautions required for the use of solvents and cleaning agents.
- Safe handling and disposal of waste materials at the conclusion of termination.

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REQUIRED SKILLS AND KNOWLEDGE

- Safe handling of fibre cables that may carry laser light energy.
- Manual means of striping and cleaning optical fibre cables.
- Optical devices to safely examine optical fibre cables.
- Mechanical means to terminate or splice optical fibre cables
- Termination devices and methods
- Preparation and splicing techniques.
- Devices used to protect terminations and splices against mechanical damage.
- Colour individual fibre cables and tubes to ensure end to end integrity.

T9. Testing optical fibre cables.

- AS/NZS 3080 Telecommunications Installations
- Concept of measurements in decibels.
- Loss measurements methods at different wavelengths of light
- Setting up required equipment for accurate testing and the calibration of that equipment.
- Precautions employed to ensure accurate measurements.
- Operating principles and applications of an Optical Time Domain Reflectometer (OTDR).
- Operating principles and applications of an visible light source and an optical light loss test set
- Extraction and recording of test reports.
- Analyse and interpretation of test reports and corrective action.

T10. Building Construction and the building codes.

- Building Codes of Australia
- Construction of domestic, commercial and industrial buildings

T11. Supporting structures and fixings

- Types of cable supporting structures, cable trays and catenaries
- Types of securing devices for anchoring cable trays and catenaries.

T12. Administration and management (records)

- Completion Compliance Certificate (TCA1)
- Contractual obligations for the provision of test results and reports to customers.
- Requirements to keep and make available copies of test results of individual fibres.
- Requirements to record cable pathways and locations of coiled extra cable length for expansion or re-termination.
- Requirements of labelling Frames, Cabinets and outlets.
- Requirements of record keeping for cross connects and patches.
- How to plan records indicating history of faults or deficiencies attributed to the fibre cable to plan replacement or maintenance.

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Evidence Guide

EVIDENCE GUIDE

9) This provides essential advice for assessment of the unit and must be read in conjunction with the performance criteria and the range statement of the unit and the Training Package Assessment Guidelines.

The Evidence Guide forms an integral part of this unit. It must be used in conjunction with all parts of the unit and performed in accordance with the Assessment Guidelines of this Training Package.

Overview of Assessment **9.1)**

Longitudinal competency development approaches to assessment, such as Profiling, require data to be reliably gathered in a form that can be consistently interpreted over time. This approach is best utilised in Apprenticeship programs and reduces assessment intervention. It is the industry-preferred model for apprenticeships. However, where summative (or final) assessment is used it is to include the application of the competency in the normal work environment or, at a minimum, the application of the competency in a realistically simulated work environment. It is recognised that, in some circumstances, assessment in part or full can occur outside the workplace. However, it must be in accordance with industry and regulatory policy.

Methods chosen for a particular assessment will be influenced by various factors. These include the extent of the assessment, the most effective locations for the assessment activities to take place, access to physical resources, additional safety measures that may be required and the critical nature of the competencies being assessed.

The critical safety nature of working with electricity, electrical equipment, gas or any other hazardous substance/material carries risk in deeming a person competent. Sources of evidence need to be ‘rich’ in nature to minimise error in judgment.

Activities associated with normal everyday work have a bearing on the decision as to how much and how detailed the data gathered will contribute to its ‘richness’. Some skills are more critical to safety and operational requirements while the same skills may be more or less frequently practised. These points are raised for the assessors to consider when choosing an assessment method and developing assessment instruments. Sample assessment instruments are included for Assessors in the Assessment

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Guidelines of this Training Package.

Critical aspects of evidence required to demonstrate competency in this unit

9.2)

Before the critical aspects of evidence are considered all prerequisites shall be met.

Evidence for competence in this unit shall be considered holistically. Each element and associated performance criteria shall be demonstrated on at least two occasions in accordance with the 'Assessment Guidelines – UEE11'. Evidence shall also comprise:

- A representative body of work performance demonstrated within the timeframes typically expected of the discipline, work function and industrial environment. In particular this shall incorporate evidence that shows a candidate is able to:
  - Implement Occupational Health and Safety workplace procedures and practices, including the use of risk control measures as specified in the performance criteria and range statement
  - Apply sustainable energy principles and practices as specified in the performance criteria and range statement
  - Demonstrate an understanding of the essential knowledge and associated skills as described in this unit. It may be required by some jurisdictions that RTOs provide a percentile graded result for the purpose of regulatory or licensing requirements.
  - Demonstrate an appropriate level of skills enabling employment
  - Conduct work observing the relevant Anti Discrimination legislation, regulations, polices and workplace procedures
- Demonstrated consistent performance across a representative range of contexts from the prescribed items below:
  - Install and modify performance data communication optical fibre cabling as described in 8) and including:

A Reading and interpreting drawings related to cable layouts, cable schedules and apparatus locations.

B Routing, placing and securing cables to comply

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	with requirements
C	Maintaining fire integrity
D	Preparing and terminating each type of cable to comply with requirements.
E	Conducting cable performance test accurately
F	Identifying and rectifying anomalies
G	Completing the necessary documentation accurately.
H	Dealing with unplanned events by drawing on essential knowledge and skills to provide appropriate solutions incorporated in a holistic assessment with the above listed items.

Note:

Successful completion of relevant vendor training may be used to contribute to evidence on which competency is deemed. In these cases the alignment of outcomes of vendor training with performance criteria and critical aspects of evidence shall be clearly identified.

Context of and specific resources for assessment

9.3)

This unit should be assessed as it relates to normal work practice using procedures, information and resources typical of a workplace. This should include:

- OHS policy and work procedures and instructions.
- Suitable work environment, facilities, equipment and materials to undertake actual work as prescribed by this unit.

These should be used in the formal learning/assessment environment.

Note:

Where simulation is considered a suitable strategy for assessment, conditions must be authentic and as far as possible reproduce and replicate the workplace and be consistent with the approved industry simulation policy.

The resources used for assessment should reflect current industry

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practices in relation to installing and modifying performance data communication optical fibre cabling

Method of assessment

9.4)

This unit shall be assessed by methods given in Volume 1, Part 3 'Assessment Guidelines'.

Note:

Competent performance with inherent safe working practices is expected in the Industry to which this competency standard unit applies. This requires assessment in a structured environment which is primarily intended for learning/assessment and incorporates all necessary equipment and facilities for learners to develop and demonstrate the essential knowledge and skills described in this unit.

Concurrent assessment and relationship with other units

9.5)

For optimisation of training and assessment effort, competency development in this unit may be arranged concurrently with unit:

UEENEEF109A	Install and connect data and voice communication equipment

Range Statement

RANGE STATEMENT

10) This relates to the unit as a whole providing the range of contexts and conditions to which the performance criteria apply. It allows for different work environments and situations that will affect performance.

This unit shall be demonstrated in relation to installing or modifying two types of performance optical fibre cables each on at least two occasions.

Generic terms used throughout this Vocational Standard shall be regarded as part of the Range Statement in which competency is demonstrated. The definition of these and other terms that apply are given in Volume 2, Part 2.1.

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Unit Sector(s)

Not applicable.

Competency Field

Competency Field **11)**

Data and Voice Communications

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UEENEEF107A Set up and configure the wireless capabilities of communications and data storage devices

Modification History

Not applicable.

Unit Descriptor

Unit Descriptor **1) Scope:**

1.1) Descriptor

This unit covers entering instructions in wireless devices with simple built-in programming function and verifying that the device operates as intended. It encompasses safe working practices, checking device software installation, following written and oral instruction and procedures and completing necessary documentation.

Note: Examples of wireless devices are personal digital assistants(PDAs), mobile phones, personal computers(PCs) remote controls etc

Application of the Unit

Application of the Unit **2)**

This unit is intended for competency development entry-level employment based programs incorporated in approved contracts of training. It may be used to augment previously acquired competencies.

Licensing/Regulatory Information

License to practice **3)**

The skills and knowledge described in this unit may require a registration to practise in the workplace subject to requirements set out ACMA 'Open' Cabling Provider Rule. Practice in workplace and during training is also

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License to practice **3)**

subject to regulations directly related to occupational health and safety and where applicable contracts of training such as apprenticeships.

Note:

1. Compliance with permits may be required in various jurisdictions and typically relates to the operation of plant, machinery and equipment such as elevating work platforms, powder operated fixing tools, power operated tools, vehicles, road signage and traffic control and lifting equipment. Permits may also be required for some work environments such as confined spaces, working aloft, near live electrical apparatus and site rehabilitation.

2. Compliance may be required in various jurisdictions relating to currency in First Aid, confined space, lifting and risk safety measures.

Pre-Requisites

Prerequisite Unit(s) **4)**

Competencies **4.1)**

Granting competency in this unit shall be made only after competency in the following unit(s) has/have been confirmed.

UEENEEE101A	Apply Occupational Health and Safety regulations, codes and practices in the workplace

Literacy and numeracy skills **4.2)**

Participants are best equipped to achieve competency in this unit if they have reading, writing and numeracy skills indicated by the following scales. Description of each scale is given in Volume 2, Part 3 ‘Literacy and Numeracy’

Reading 3 Writing 3 Numeracy 3

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Employability Skills Information

Employability Skills **5)**

The required outcomes described in this unit of competency contain applicable facets of Employability Skills. The Employability Skills Summary of the qualification in which this unit of competency is packaged will assist in identifying Employability Skill requirements.

Elements and Performance Criteria Pre-Content

6) Elements describe the essential outcomes of a competency standard unit

Performance Criteria describe the required performance needed to demonstrate achievement of the element. Assessment of performance is to be consistent with the Evidence Guide.

Elements and Performance Criteria

ELEMENT	PERFORMANCE CRITERIA
1 Prepare to enter operating instructions.	1.1 OHS procedures for a given work area are identified, obtained and understood through established routines and procedures.
	1.2 Established OHS risk control measures and procedures in preparation for the work are followed.
	1.3 Safety hazards that have not previously been identified are reported and advise on risk control measures are sought from the work supervisor.
	1.4 Work supervisor or customers are consulted to determine which functions of the device are to be use and the parameter of each.
	1.5 Tools, equipment and testing devices needed to carry out the work are obtained and checked for correct operation and safety.

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ELEMENT	PERFORMANCE CRITERIA	
	1.6	Device installation is checked for compliance with job specification and regulations where they apply.
2 Enter operating instructions.	2.1	Established OHS risk control measures and procedures for carrying out the work are followed.
	2.2	Circuits/machines/plant are checked as being isolated where necessary in strict accordance OHS requirements and procedures.
	2.3	The required status of each function of the device is entered and their parameters set in accordance with manufactures programming instructions.
	2.4	Entered data are checked as meeting those specified by the work supervisor or customer.
	2.5	Procedures for referring non-routine events to immediate supervisor for directions are followed.
3 Test device operation and report.	3.1	Device operation is tested in strict accordance OHS requirements and procedures.
	3.2	Operating anomalies are identified and corrected in accordance with established routines.
	3.3	OHS work completion risk control measures and procedures are followed.
	3.4	Work site is cleaned and made safe in accordance with established procedures.
	3.5	Work completion is reported and appropriate person(s) notified in accordance with established routines.

Required Skills and Knowledge

REQUIRED SKILLS AND KNOWLEDGE

8) This describes the essential skills and knowledge and their level, required for this

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REQUIRED SKILLS AND KNOWLEDGE

unit.

Evidence shall show that knowledge has been acquired of safe working practices and set up and configuring the wireless capabilities of communications and data storage devices.

All knowledge and skills detailed in this unit should be contextualised to current industry practices and technologies..

KS01-EF107A Wireless devices

Evidence shall show an understanding of wireless devices, applying safe working practices and relevant Standards, Codes and Regulations to an extent indicated by the following aspects:

T1. Types and applications

T2. Operating principles at sub-system level

T3. Programming functions

T4. Networking set up

Evidence Guide

EVIDENCE GUIDE

9) This provides essential advice for assessment of the unit and must be read in conjunction with the performance criteria and the range statement of the unit and the Training Package Assessment Guidelines.

The Evidence Guide forms an integral part of this unit. It must be used in conjunction with all parts of the unit and performed in accordance with the Assessment Guidelines of this Training Package.

Overview of Assessment **9.1)**

Longitudinal competency development approaches to assessment, such as Profiling, require data to be reliably gathered in a form that can be consistently interpreted over time. This approach is best utilised in Apprenticeship programs and reduces assessment intervention. It is the industry-preferred model for apprenticeships. However, where summative (or final) assessment is used it is to include the application of the competency in the normal work environment or, at a minimum, the application of the competency in a realistically simulated work environment. It is recognised that,

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in some circumstances, assessment in part or full can occur outside the workplace. However, it must be in accordance with industry and regulatory policy.

Methods chosen for a particular assessment will be influenced by various factors. These include the extent of the assessment, the most effective locations for the assessment activities to take place, access to physical resources, additional safety measures that may be required and the critical nature of the competencies being assessed.

The critical safety nature of working with electricity, electrical equipment, gas or any other hazardous substance/material carries risk in deeming a person competent. Sources of evidence need to be 'rich' in nature to minimise error in judgment.

Activities associated with normal everyday work have a bearing on the decision as to how much and how detailed the data gathered will contribute to its 'richness'. Some skills are more critical to safety and operational requirements while the same skills may be more or less frequently practised. These points are raised for the assessors to consider when choosing an assessment method and developing assessment instruments. Sample assessment instruments are included for Assessors in the Assessment Guidelines of this Training Package.

Critical aspects of evidence required to demonstrate competency in this unit

9.2)

Before the critical aspects of evidence are considered all prerequisites shall be met.

Evidence for competence in this unit shall be considered holistically. Each element and associated performance criteria shall be demonstrated on at least two occasions in accordance with the 'Assessment Guidelines – UEE11'. Evidence shall also comprise:

- A representative body of work performance demonstrated within the timeframes typically expected of the discipline, work function and industrial environment. In particular this shall incorporate evidence that shows a candidate is able to:
  - Implement Occupational Health and Safety workplace procedures and practices, including the use of risk control measures as specified in the performance criteria and range

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statement

- Apply sustainable energy principles and practices as specified in the performance criteria and range statement
- Demonstrate an understanding of the essential knowledge and associated skills as described in this unit. It may be required by some jurisdictions that RTOs provide a percentile graded result for the purpose of regulatory or licensing requirements.
- Demonstrate an appropriate level of skills enabling employment
- Conduct work observing the relevant Anti Discrimination legislation, regulations, polices and workplace procedures

- Demonstrated consistent performance across a representative range of contexts from the prescribed items below:
  - Set up the wireless capabilities of communications and data storage devices as described in 8) and including:

A	Understanding required operating functions and parameters.
B	Identifying non-compliance conditions of device installation.
C	Entering functions and parameters correctly.
D	Correcting programming anomalies.
E	Testing and verify device operation.
F	Dealing with unplanned events by drawing on essential knowledge and skills to provide appropriate solutions incorporated in a holistic assessment with the above listed items

Note:

Successful completion of relevant vendor training may be used to contribute to evidence on which competency is deemed. In these cases the alignment of outcomes of vendor training with performance criteria and critical aspects of evidence shall be clearly identified.

Context of and specific resources for assessment

9.3)

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This unit should be assessed as it relates to normal work practice using procedures, information and resources typical of a workplace. This should include:

- OHS policy and work procedures and instructions.
- Suitable work environment, facilities, equipment and materials to undertake actual work as prescribed by this unit.

These should be used in the formal learning/assessment environment.

Note:

Where simulation is considered a suitable strategy for assessment, conditions must be authentic and as far as possible reproduce and replicate the workplace and be consistent with the approved industry simulation policy.

The resources used for assessment should reflect current industry practices in relation to setting up the wireless capabilities of communications and data storage devices.

Method of assessment

9.4)

This unit shall be assessed by methods given in Volume 1, Part 3 'Assessment Guidelines'.

Note:

Competent performance with inherent safe working practices is expected in the Industry to which this competency standard unit applies. This requires assessment in a structured environment which is primarily intended for learning/assessment and incorporates all necessary equipment and facilities for learners to develop and demonstrate the essential knowledge and skills described in this unit.

Concurrent assessment and relationship with other units

9.5)

There are no concurrent assessment recommendations for this unit.

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Range Statement

RANGE STATEMENT

10) This relates to the unit as a whole providing the range of contexts and conditions to which the performance criteria apply. It allows for different work environments and situations that will affect performance.

This unit shall be demonstrated in relation to entering and verifying operating instruction in at least two types of microprocessor equipped devices with built-in icon-based programmable functions such as programmable relays, timers, temperature controllers, detection devices for security and fire.

Generic terms used throughout this Vocational Standard shall be regarded as part of the Range Statement in which competency is demonstrated. The definition of these and other terms that apply are given in Volume 2, Part 2.1.

Unit Sector(s)

Not applicable.

Competency Field

Competency Field **11)**

Data and Voice Communications

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UEENEEF108A Select and arrange equipment for wireless communication networks

Modification History

Not applicable.

Unit Descriptor

Unit Descriptor **1) Scope:**

1.1) Descriptor

This unit covers selecting and arranging of wireless access devices, routers and switches for local area and wide area networks intended for connection to a telecommunications network. The unit encompasses selecting compliant equipment, developing LAN/WAN arrangements that comply with regulation, based on calculated and deemed-to-comply solutions and completing network documentation.

Application of the Unit

Application of the Unit **2)**

This unit is intended as an additional competency to relevant competencies previously acquired and is therefore not applicable to those entering work.

Licensing/Regulatory Information

License to practice **3)**

The skills and knowledge described in this unit do not require a license to practice in the workplace. However practice in this unit is subject to regulations directly related to occupational health and safe and contracts of training such as new apprenticeships.

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Pre-Requisites

Prerequisite Unit(s) **4)**

Competencies **4.1)**

Granting competency in this unit shall be made only after competency in the following unit(s) has/have been confirmed.

UEENEEE101A	Apply Occupational Health and Safety regulations, codes and practices in the workplace

Literacy and numeracy skills **4.2)**

Participants are best equipped to achieve competency in this unit if they have reading, writing and numeracy skills indicated by the following scales. Description of each scale is given in Volume 2, Part 3 ‘Literacy and Numeracy’

Reading	3	Writing	3	Numeracy	3

Employability Skills Information

Employability Skills **5)**

The required outcomes described in this unit of competency contain applicable facets of Employability Skills. The Employability Skills Summary of the qualification in which this unit of competency is packaged will assist in identifying Employability Skill requirements.

Elements and Performance Criteria Pre-Content

6) Elements describe the essential outcomes of a competency standard unit	Performance Criteria describe the required performance needed to demonstrate achievement of the element. Assessment of performance is to be consistent with the Evidence Guide.

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Elements and Performance Criteria

ELEMENT	PERFORMANCE CRITERIA
1 Prepare to select equipment.	1.1 The extent and nature of the communications network is determined from job specifications.
	1.2 Safety and other regulatory requirements to which the wireless network area shall comply are identified, obtained and understood.
2 Arrange locations of equipment and cable routes.	2.1 Location of equipment is arranged to comply with job specifications and regulatory requirements.
	2.2 Cable routes are planned to ensure maximum lengths specified by standards and the manufacturer are not exceeded.
	2.3 Cable routes are planned to comply with job specifications and regulatory requirements.
	2.4 Earthing is arranged to comply with job specifications and regulatory requirements.
3 Select cables and equipment.	3.1 Cables types are selected for suitability for the environments in which they are to be installed, performance required, and regulatory requirements.
	3.2 Cable sizes are selected to meet capacity and performance requirements.
	3.3 Earthing components are selected to meet regulatory and earthing requirements.
	3.4 Evidence is obtained that network equipment selected complies with safety requirements.
	3.5 Electronic equipment types are selected for suitability for the environments in which they are to be installed, performance required, and regulatory requirements.
4 Document communications	4.1 Reasons for selections made, including calculations, are documented in accordance with

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ELEMENT	PERFORMANCE CRITERIA
network.	established procedures.
	4.2 Wireless networks equipment for arrangement and specifications for all selected items are documented in accordance with established procedures and forwarded to appropriate person(s).

Required Skills and Knowledge

REQUIRED SKILLS AND KNOWLEDGE

8) This describes the essential skills and knowledge and their level, required for this unit.

Evidence shall show that knowledge has been acquired of safe working practices and selecting and arranging equipment for wireless networks.

All knowledge and skills detailed in this unit should be contextualised to current industry practices and technologies.

KS01-EF108A Wireless network equipment, selection and arrangements

Evidence shall show an understanding of wireless network equipment selection and arrangements, applying safe working practices and relevant Standards, Codes and Regulations to an extent indicated by the following aspects:

T1. Operating systems and networks

- Operating system fundamentals
- Networking fundamentals
- Physical components of a network
- Transmission Control Protocol / Internet Protocol (TCP / IP) encompassing:
- Network Services
- Network Operating Systems
- Installation and boot processes

T2. Wireless network components for local area and wide area networks

- Types of devices, routers , switches and cables
- Construction and operating principles
- Selection of compliant components and cables

T3. Wireless network configurations

- LAN/WAN arrangements and component locations
- Cable routing

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REQUIRED SKILLS AND KNOWLEDGE

- Earthing
- Compliance with job specifications and regulation/s
- Calculated and deemed-to-comply solutions and completing network documentation.

T4. Wireless network security

T5. Wireless network documentation

- Purpose and extent of maintaining work activities records in an enterprise
- Types of records for maintaining work activities in an enterprise
- Methods for recording and maintaining work records
- Work records required by regulation requirements
- Established procedures and appropriate person(s).
- Reasons for selections made, including calculations
- Wireless networks equipment for arrangement and specifications for all selected items

Evidence Guide

EVIDENCE GUIDE

9) This provides essential advice for assessment of the unit and must be read in conjunction with the performance criteria and the range statement of the unit and the Training Package Assessment Guidelines.

The Evidence Guide forms an integral part of this unit. It must be used in conjunction with all parts of the unit and performed in accordance with the Assessment Guidelines of this Training Package.

Overview of Assessment **9.1)**

Longitudinal competency development approaches to assessment, such as Profiling, require data to be reliably gathered in a form that can be consistently interpreted over time. This approach is best utilised in Apprenticeship programs and reduces assessment intervention. It is the industry-preferred model for apprenticeships. However, where summative (or final) assessment is used it is to include the application of the competency in the normal work environment or, at a minimum, the application of the competency in a realistically simulated work environment. It is recognised that, in some circumstances, assessment in part or full can occur outside the workplace. However, it must be in accordance with industry

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and regulatory policy.

Methods chosen for a particular assessment will be influenced by various factors. These include the extent of the assessment, the most effective locations for the assessment activities to take place, access to physical resources, additional safety measures that may be required and the critical nature of the competencies being assessed.

The critical safety nature of working with electricity, electrical equipment, gas or any other hazardous substance/material carries risk in deeming a person competent. Sources of evidence need to be 'rich' in nature to minimise error in judgment.

Activities associated with normal everyday work have a bearing on the decision as to how much and how detailed the data gathered will contribute to its 'richness'. Some skills are more critical to safety and operational requirements while the same skills may be more or less frequently practised. These points are raised for the assessors to consider when choosing an assessment method and developing assessment instruments. Sample assessment instruments are included for Assessors in the Assessment Guidelines of this Training Package.

Critical aspects of evidence required to demonstrate competency in this unit

9.2)

Before the critical aspects of evidence are considered all prerequisites shall be met.

Evidence for competence in this unit shall be considered holistically. Each element and associated performance criteria shall be demonstrated on at least two occasions in accordance with the 'Assessment Guidelines – UEE11'. Evidence shall also comprise:

- A representative body of work performance demonstrated within the timeframes typically expected of the discipline, work function and industrial environment. In particular this shall incorporate evidence that shows a candidate is able to:
  - Implement Occupational Health and Safety workplace procedures and practices, including the use of risk control measures as specified in the performance criteria and range statement
  - Apply sustainable energy principles and practices as

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specified in the performance criteria and range statement

- Demonstrate an understanding of the essential knowledge and associated skills as described in this unit. It may be required by some jurisdictions that RTOs provide a percentile graded result for the purpose of regulatory or licensing requirements.
- Demonstrate an appropriate level of skills enabling employment
- Conduct work observing the relevant Anti Discrimination legislation, regulations, polices and workplace procedures

- Demonstrated consistent performance across a representative range of contexts from the prescribed items below:
  - Select and arrange equipment for wireless networks as described in 8) and including:

A	Arranging network to comply with safety and other regulatory and functional requirements
B	Selecting appropriate types and sizes of cables
C	Arranging network equipment
D	Selecting appropriate earthing components
E	Documenting installation arrangement, specification for items selected and reasons for the selections made
F	Dealing with unplanned events by drawing on essential knowledge and skills to provide appropriate solutions incorporated in a holistic assessment with the above listed items.

Context of and specific resources for assessment

9.3)

This unit should be assessed as it relates to normal work practice using procedures, information and resources typical of a workplace. This should include:

- OHS policy and work procedures and instructions.
- Suitable work environment, facilities, equipment and materials to undertake actual work as prescribed by this unit.

These should be used in the formal learning/assessment

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environment.

Note:

Where simulation is considered a suitable strategy for assessment, conditions must be authentic and as far as possible reproduce and replicate the workplace and be consistent with the approved industry simulation policy.

The resources used for assessment should reflect current industry practices in relation to selecting and arranging equipment for wireless networks.

Method of assessment

9.4)

This unit shall be assessed by methods given in Volume 1, Part 3 'Assessment Guidelines'.

Note:

Competent performance with inherent safe working practices is expected in the Industry to which this competency standard unit applies. This requires assessment in a structured environment which is primarily intended for learning/assessment and incorporates all necessary equipment and facilities for learners to develop and demonstrate the essential knowledge and skills described in this unit.

Concurrent assessment and relationship with other units

9.5)

Nil

Range Statement

RANGE STATEMENT

10) This relates to the unit as a whole providing the range of contexts and conditions to which the performance criteria apply. It allows for different work environments and situations that will affect performance.

This unit shall be demonstrated in relation to selecting and arranging equipment for

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RANGE STATEMENT

wireless networks comprising a representative range of network wireless components.

Generic terms used throughout this Vocational Standard shall be regarded as part of the Range Statement in which competency is demonstrated. The definition of these and other terms that apply are given in Volume 2, Part 2.1.

Unit Sector(s)

Not applicable.

Competency Field

Competency Field **11)**

Data and Voice Communications

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UEENEEF111A Test, report and rectify faults in data and voice installations

Modification History

Not applicable.

Unit Descriptor

Unit Descriptor **1) Scope:**

1.1) Descriptor

This unit covers testing for certification finding and repairing faults in telecommunication installations and local area networks. The unit encompasses working safely, reading cabling diagrams, performance testing, applying logical fault finding procedures, testing functionality of the network, conducting repairs and completing the necessary documentation.

Application of the Unit

Application of the Unit **2)**

This unit is intended for competency development in entry-level employment based programs incorporated in approved contracts of training

Licensing/Regulatory Information

License to practice **3)**

The skills and knowledge described in this unit require a registration to practise in the workplace subject to requirements set out ACMA ‘Open’ Cabling Provider Rule. Practice in workplace and during training is also subject to regulations directly related to occupational health and safety and where applicable contracts of training such as apprenticeships.

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License to practice **3)**

Note:

1. Compliance with permits may be required in various jurisdictions and typically relates to the operation of plant, machinery and equipment such as elevating work platforms, powder operated fixing tools, power operated tools, vehicles, road signage and traffic control and lifting equipment. Permits may also be required for some work environments such as confined spaces, working aloft, near live electrical communications equipment and site rehabilitation.

2. Compliance may be required in various jurisdictions relating to currency in First Aid, confined space, lifting and risk safety measures.

Pre-Requisites

Prerequisite Unit(s) **4)**

Competencies **4.1)**

Granting competency in this unit shall be made only after competency in the following unit(s) has/have been confirmed.

UEENEEE101A	Apply Occupational Health and Safety regulations, codes and practices in the workplace
UEENEEE102A	Fabricate, assemble and dismantle utilities industry components
UEENEEE104A	Solve problems in d.c. circuits
UEENEEE105A	Fix and secure electrotechnology equipment
UEENEEE107A	Use drawings, diagrams, schedules, standards, codes and specifications
UEENEEF102A	Install and maintain cabling for multiple access to telecommunication services
UEENEEF10	Install and modify performance data

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Prerequisite Unit(s) **4)**

4A	communication copper cabling
UEENEEF105A	Install and modify performance data communication optical fibre cabling

Literacy and numeracy skills **4.2)**

Participants are best equipped to achieve competency in this unit if they have reading, writing and numeracy skills indicated by the following scales. Description of each scale is given in Volume 2, Part 3 ‘Literacy and Numeracy’

Reading	3	Writing	3	Numeracy	3

Employability Skills Information

Employability Skills **5)**

The required outcomes described in this unit of competency contain applicable facets of Employability Skills. The Employability Skills Summary of the qualification in which this unit of competency is packaged will assist in identifying Employability Skill requirements.

Elements and Performance Criteria Pre-Content

6) Elements describe the essential outcomes of a competency standard unit	Performance Criteria describe the required performance needed to demonstrate achievement of the element. Assessment of performance is to be consistent with the Evidence Guide.

Elements and Performance Criteria

ELEMENT	PERFORMANCE CRITERIA

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ELEMENT	PERFORMANCE CRITERIA	
1 Prepare to test, report and rectify faults.	1.1	OHS procedures for a given work area are identified, obtained and understood.
	1.2	Health and safety risks are identified, and established risk control measures and procedures in preparation for the work are followed.
	1.3	Safety hazards that have not previously been identified are noted, and established risk control measures are implemented.
	1.4	Testing is prepared in consultation with others affected by the work and sequenced appropriately.
	1.5	The nature and location of the work is determined from documentation or in discussion with appropriate person(s) to establish the scope of work to be undertaken.
	1.6	Advice is sought from appropriate persons to ensure the work is coordinated effectively with others.
	1.7	Material needed for the testing, reporting and rectifying work is obtained in accordance with established procedures and checked against job requirements.
	1.8	Tools, equipment and testing devices needed to for the work are obtained in accordance with established procedures and checked for correct operation and safety.
	1.9	Preparatory work is checked to ensure no damage has occurred and that it complies with requirements.
2 Test and rectify faults	2.1	OHS risk control measures and procedures for carrying out the work are followed.
	2.2	Tests are carried out in strict accordance with OHS established safety procedures.
	2.3	Tests are prepared and conducted in accordance with test equipment operating instructions and requirements.

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ELEMENT		PERFORMANCE CRITERIA	
		2.4	Cable performance tests are conducted accurately and results documented in accordance with established procedures.
		2.5	Causes of defects or faults indicated by test results are identified and rectified in accordance with established procedures.
		2.6	Established methods for dealing with unexpected situations are discussed with appropriate person(s) and documented.
		2.7	Unexpected situations are dealt with safely and with the approval of an authorised person.
		2.8	Ongoing checks of the quality of installed equipment are undertaken in accordance with established procedures.
		2.9	Testing and rectifying faults is carried out efficiently without waste of materials or damage to equipment, circuits, the surrounding environment or services and using sustainable energy principles.
3	Document and verify installation performance.	3.1	OHS work completion risk control measures and procedures are followed.
		3.2	Work site is cleaned and made safe in accordance with established procedures.
		3.3	Service reports are completed, when necessary in accordance with established procedures.
		3.4	Documentation certifying system performance is issued to an appropriate person(s).

Required Skills and Knowledge

REQUIRED SKILLS AND KNOWLEDGE

8) This describes the essential skills and knowledge and their level, required for this unit.

Evidence shall show that knowledge has been acquired of safe working practices and

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REQUIRED SKILLS AND KNOWLEDGE

testing, reporting and rectifying faults in voice and data installations.

All knowledge and skills detailed in this unit should be contextualised to current industry practices and technologies.

KS01-EF111A Data and voice cabling testing devices and techniques

Evidence shall show an understanding of data and voice cabling testing devices and techniques, applying safe working practices and relevant Standards, Codes and Regulations to an extent indicated by the following aspects:

T1. Networking fundamentals

- Analogue and digital signals encompassing:
  - How information is carried
  - Signal distortion

Examples include attenuation, reflection, noise, dispersion, jitter, latency and collisions

  - Types of networks, network components and hardware
  - Local Area Network (LAN) architectures
  - Networking protocols and the OSI model
  - Network signal propagation
  - Transmission Control Protocol / Internet Protocol (TCP/IP)
  - Basics of Encoding Networking Signals
  - Internet services

T2. Basic electrical testing and measuring devices and techniques encompassing:

- Types and applications of testing/measuring devices including voltage testers, multimeters, clamp meters, continuity testers and insulation resistance testers.
- Features of testing/measuring devices including safety, user calibration and parameter and range settings.
- Connection of test/measuring devices into a circuit
  - safety procedures
  - circuit arrangement of test/measuring devices
- Taking readings
- Storage, maintenance and care of test/measuring devices.
- Australian Standard quality assurance requirements for test equipment calibration certification.

T3. Performance parameters associated with copper cables, coaxial cables and optical cables encompassing:

- Open circuit, short circuit and pair continuity
- Split pair and crossed pair
- Attenuation

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REQUIRED SKILLS AND KNOWLEDGE

- Return loss
- Insulation Resistance (leakage)
- Near end cross talk (NEXT)
- Attenuation to cross talk ratio (ACR)
- Loop resistance
- Noise (Impulse noise and average noise)
- Characteristic impedance

Note: Structured cabling including, twisted pair cabling, shielded twisted pair (STP), unshielded twisted pair (UTP) and higher performance cabling.

T4. Test results for compliance with required regulation, standards, and or codes for structured copper cables, coaxial; and optical fibre cables encompassing:

- Tests required to evaluate a given performance parameter
- Test equipment and leads needed to evaluate a given performance parameter.
- Operation of test equipment for correct evaluation of specific cable performance parameters and to obtain accurate and reliable results.
- Transmission performance requirements.

T5. Testing and validation of a customer premises cabling installation encompassing:

- Requirements of current Standard of site certification for high performance copper cables, coaxial cable and optical fibre cables
- Reporting requirements for the completion of work related to conformity of a cabling installation.
- Documentation required in certifying a cabling installation conforms to relevant standards and specifications.

T1. Optical Time Domain Reflectometer (OTDR) operating principles, applications and calibration procedures encompassing:

T2. Typical causes of non compliant test results.

T3. Recording, reporting and maintaining test results encompassing:

- Purpose and extent of maintaining work activities records in an enterprise
- Types of records for maintaining work activities in an enterprise
- Methods for recording and maintaining work records
- Work records required by regulation requirements

Evidence Guide

EVIDENCE GUIDE

9) This provides essential advice for assessment of the unit and must be read in

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EVIDENCE GUIDE

conjunction with the performance criteria and the range statement of the unit and the Training Package Assessment Guidelines.

The Evidence Guide forms an integral part of this unit. It must be used in conjunction with all parts of the unit and performed in accordance with the Assessment Guidelines of this Training Package.

Overview of Assessment **9.1)**

Longitudinal competency development approaches to assessment, such as Profiling, require data to be reliably gathered in a form that can be consistently interpreted over time. This approach is best utilised in Apprenticeship programs and reduces assessment intervention. It is the industry-preferred model for apprenticeships. However, where summative (or final) assessment is used it is to include the application of the competency in the normal work environment or, at a minimum, the application of the competency in a realistically simulated work environment. It is recognised that, in some circumstances, assessment in part or full can occur outside the workplace. However, it must be in accordance with industry and regulatory policy.

Methods chosen for a particular assessment will be influenced by various factors. These include the extent of the assessment, the most effective locations for the assessment activities to take place, access to physical resources, additional safety measures that may be required and the critical nature of the competencies being assessed.

The critical safety nature of working with electricity, electrical equipment, gas or any other hazardous substance/material carries risk in deeming a person competent. Sources of evidence need to be ‘rich’ in nature to minimise error in judgment.

Activities associated with normal everyday work have a bearing on the decision as to how much and how detailed the data gathered will contribute to its ‘richness’. Some skills are more critical to safety and operational requirements while the same skills may be more or less frequently practised. These points are raised for the assessors to consider when choosing an assessment method and developing assessment instruments. Sample assessment instruments are included for Assessors in the Assessment Guidelines of this Training Package.

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Critical aspects of evidence required to demonstrate competency in this unit

9.2)

Before the critical aspects of evidence are considered all prerequisites shall be met.

Evidence for competence in this unit shall be considered holistically. Each element and associated performance criteria shall be demonstrated on at least two occasions in accordance with the 'Assessment Guidelines – UEE11'. Evidence shall also comprise:

- A representative body of work performance demonstrated within the timeframes typically expected of the discipline, work function and industrial environment. In particular this shall incorporate evidence that shows a candidate is able to:
  - Implement Occupational Health and Safety workplace procedures and practices, including the use of risk control measures as specified in the performance criteria and range statement
  - Apply sustainable energy principles and practices as specified in the performance criteria and range statement
  - Demonstrate an understanding of the essential knowledge and associated skills as described in this unit. It may be required by some jurisdictions that RTOs provide a percentile graded result for the purpose of regulatory or licensing requirements.
  - Demonstrate an appropriate level of skills enabling employment
  - Conduct work observing the relevant Anti Discrimination legislation, regulations, polices and workplace procedures
- Demonstrated consistent performance across a representative range of contexts from the prescribed items below:
  - Test, report and rectify faults in voice and data installations as described in 8) and including:

A Reading and interpreting drawings and schedules of the installation

B Preparing and conducting appropriate test accurately

C Interpreting test results correctly

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D	Identifying defects/faults from test results
E	Rectifying faults effectively
F	Completing the required documentation accurately.
G	Dealing with unplanned events by drawing on essential knowledge and skills to provide appropriate solutions incorporated in a holistic assessment with the above listed items

Context of and specific resources for assessment

9.3)

This unit should be assessed as it relates to normal work practice using procedures, information and resources typical of a workplace. This should include:

- OHS policy and work procedures and instructions.
- Suitable work environment, facilities, equipment and materials to undertake actual work as prescribed by this unit.

These should be used in the formal learning/assessment environment.

Note:

Where simulation is considered a suitable strategy for assessment, conditions must be authentic and as far as possible reproduce and replicate the workplace and be consistent with the approved industry simulation policy.

The resources used for assessment should reflect current industry practices in relation to testing, reporting and rectifying faults in voice and data installations

Method of assessment

9.4)

This unit shall be assessed by methods given in Volume 1, Part 3 ‘Assessment Guidelines’.

Note:

Competent performance with inherent safe working practices is expected in the Industry to which this competency standard unit applies. This requires assessment in a structured environment

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which is primarily intended for learning/assessment and incorporates all necessary equipment and facilities for learners to develop and demonstrate the essential knowledge and skills described in this unit.

Concurrent assessment and relationship with other units

9.5)

For optimisation of training and assessment effort, competency development in this unit may be arranged concurrently with unit:

UEENEEF104A	Install and modify performance data communication copper cabling
UEENEEF105A	Install and modify optical fibre performance data communication cabling
UEENEEF109A	Install and connect voice and data communications equipment

Range Statement

RANGE STATEMENT

10) This relates to the unit as a whole providing the range of contexts and conditions to which the performance criteria apply. It allows for different work environments and situations that will affect performance.

This unit shall be demonstrated in relation to testing, reporting and rectifying faults in voice and data installations comprising two different items of customer premises equipment and a local area network.

Generic terms used throughout this Vocational Standard shall be regarded as part of the Range Statement in which competency is demonstrated. The definition of these and other terms that apply are given in Volume 2, Part 2.1.

Unit Sector(s)

Not applicable.

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Competency Field

Competency Field 11)

Data and Voice Communications

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UEENEEG006A Solve problems in single and three phase low voltage machines

Modification History

Not Applicable

Unit Descriptor

Unit Descriptor **1**)

1.1) Descriptor

This unit covers ascertaining correct operation of single and three phase machines and solving machine problems as they apply to servicing, fault finding, installation and compliance work functions. It encompasses safe working practices, machine connections circuit arrangements, issues related to machine operation, characteristics and protection and solutions to machine problems derived from calculated and measured parameters.

Application of the Unit

Not Applicable

Licensing/Regulatory Information

1.2) License to practice

During Training: Competency development activities are subject to regulations directly related to licencing, occupational health and safety and where applicable contracts of training such as apprenticeships.

In the workplace: The application of the skills and knowledge described in this unit require a license to practice in the workplace where work is carried out on electrical equipment or installations which are designed to operate at voltages greater than 50 V a.c. or 120 V d.c.

Other conditions may apply under State and Territory legislative and regulatory requirements.

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Pre-Requisites

Prerequisite Unit(s) **2)**

2.1) Competencies

Granting competency in this unit shall be made only after competency in the following unit(s) has/have been confirmed.

UEENEEE101A	Apply Occupational Health and Safety regulations, codes and practices in the workplace
UEENEEE102A	Fabricate, dismantle, assemble of electrotechnology components
UEENEEE104A	Solve problems in d.c circuits
UEENEEE105A	Fix and secure electrotechnology equipment
UEENEEE107A	Use drawings, diagrams, schedules, standards, codes and specifications
UEENEEG101A	Solve problems in electromagnetic devices and related circuits
UEENEEG102A	Solve problems in low voltage a.c. circuit
UEENEEG106A	Terminate cables, cords and accessories for low voltage circuits

Employability Skills Information

Employability Skills **3)**

This unit contains Employability Skills

The required outcomes described in this unit of competency contain applicable facets of Employability Skills. The Employability Skills Summary of the qualification in which this unit of competency is packaged

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will assist in identifying Employability Skill requirements.

Application of the Unit **4**)

4.1) **General Application**

This unit applies to all qualifications, competencies and/or Skill Sets which require an electrical licence.

4.2) **Importation**

RTOs wishing to import this unit into any qualification under the flexibility provisions of NQC Training Package Policy

Elements and Performance Criteria Pre-Content

6) Elements describe the essential outcomes of a unit of competency

Elements and Performance Criteria

ELEMENT	PERFORMANCE CRITERIA
1 Prepare to solve single and three phase low voltage machines problems.	1.1 OHS procedures for a given work area are identified, obtained and understood.
	1.2 Established OHS risk control measures and procedures in preparation for the work are followed.
	1.3 Safety hazards, which have not previously been identified, are noted and established risk control measures are implemented.
	1.4 The nature of the machine (s) problem is obtained from documentation or from work supervisor to establish the scope of work to be undertaken.
	1.5 Advice is sought from the work supervisor to ensure the work is coordinated effectively with others.
	1.6 Sources of materials that may be required for the work are established in accordance with established

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ELEMENT	PERFORMANCE CRITERIA	
		procedures.
	1.7	Tools, equipment and testing devices needed to carry out the work are obtained and checked for correct operation and safety.
2 Solve single and three phase low voltage machine problems.	2.1	OHS risk control measures and procedures for carrying out the work are followed.
	2.2	The need to test or measure live is determined in strict accordance with OHS requirements and when necessary conducted within established safety procedures.
	2.3	Circuits/machines/plant are checked as being isolated where necessary in strict accordance OHS requirements and procedures.
	2.4	Established methods are used to solve machine problems from measure and calculated values as they apply to single and three-phase low voltage machines.
	2.5	Established methods for dealing with unexpected situations are discussed with appropriate person or persons and documented.
	2.6	Unexpected situations are dealt with safely and with the approval of an authorised person.
	2.7	Problems are solved without damage to machines, circuits, the surrounding environment or services and using sustainable energy practices.
3 Complete work and document problem solving activities.	3.1	OHS work completion risk control measures and procedures are followed.
	3.2	Work site is cleaned and made safe in accordance with established procedures.
	3.3	Justification for solutions used to solve machine problems is documented.
	3.4	Work completion is documented and an appropriate person or persons notified in accordance with established procedures.

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Required Skills and Knowledge

REQUIRED SKILLS AND KNOWLEDGE

7) This describes the essential skills and knowledge and their level, required for this unit.

Evidence shall show that knowledge has been acquired of safe working practices and solving problems in single and three phase low voltage machines.

The knowledge and skills shall be contextualised to current industry standards, technologies and practices.

KS01-EG006A Single and three-phase transformers

Evidence shall show an understanding of single and three phase transformers to an extent indicated by the following aspects:

T1 Transformer construction encompassing:

- types of lamination style and core construction used in single-phase, three phase, double wound, auto transformers and instrument transformers.
- identification of different winding styles/types used in transformers.
- methods used to insulate low and high voltage transformers.
- construction of transformer tanks for distribution transformers.
- transformer auxiliary equipment. (Bushings, surge-diverters, tap-changers, hot oil & winding indicators, breather, Buchholz relay and conservator).
- function of transformer auxiliary equipment.
- types of information stated on transformer nameplates.
- application of transformers.
- performing basic insulation resistance, continuity and winding identification tests.

T2 Transformer operation encompassing:

- principles of mutual induction of a transformer.
- factors that determine the induced voltage in a transformer winding.
- determining the value of a transformers secondary voltage and current given one winding’s electrical details and turns ratio.
- identification of voltage and current components of a phasor diagram for a transformer on no-load.
- principles of power transferred from the primary to secondary when a load is connected using a phasor diagram neglecting impedance drops.
- selecting transformers for specific application/s.
- safety features specified in AS/NZS3000 with respect to transformers and isolating transformers.

T3 Transformer losses, efficiency and cooling encompassing:

- power losses which occur in a transformer.

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REQUIRED SKILLS AND KNOWLEDGE

- tests which allow the power losses of a transformer to be determine.
- determination of transformer losses and efficiency using test results.
- relationship between transformer cooling and rating.
- methods used for natural and forced cooling of transformers.
- properties of transformer oil.
- tests conducted on transformer oil.

T4 Transformer voltage regulation and percent impedance encompassing:

- voltage regulation as applicable to a transformer.
- reasons for voltage variation in the output of a transformer.
- determine the voltage regulation of a transformer from voltage and percentage impedance values.
- percentage impedance as applied to transformers.
- determine the percent impedance by using test results.
- determine percent impedance of a transformer by calculation.

T5 Parallel operation of transformers and transformer auxiliary equipment encompassing:

- determine polarity markings for an unidentified single phase double wound transformer.
- need for parallel operation of transformers.
- conditions/restrictions required before two transformers can be connected in parallel.
- connecting transformers in parallel to supply a single load (loading on transformers operating in parallel).
- the consequences/effect of an incorrect connection.

T6 Auto-transformers and instrument transformers encompassing:

- identification of auto-transformers, voltage transformers and current transformers from their winding diagrams.
- determining voltage and current in the windings of an auto-transformer by calculation.
- advantages and disadvantages of an auto-transformer.
- AS/NZS3000 requirements with respect to transformers.
- construction of voltage transformers.
- ratings of voltage transformers.
- construction of current transformers.
- ratings of current transformers.
- precautionary measures taken to connect and disconnect instrument transformers.
- connection diagrams for instrument transformers.
- applications for auto-transformers and instrument transformers.

KS02-EG006A Alternating current rotating machines

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REQUIRED SKILLS AND KNOWLEDGE

Evidence shall show an understanding of alternating current rotating machines to an extent indicated by the following aspects:

T1 Operating Principles of three phase induction motors encompassing:

- determining circuit operating characteristics by using the right hand (grip) rule for conductors and solenoids and Fleming's left and right hand rules.
- characteristics of the magnetic field produced by a single, two and three-phase windings.
- speed of rotation of a rotating magnetic field.
- relationship between the rotor speed, slip and rotor frequency.
- basic principle of operation of an induction motor.
- reversing the direction of rotation of a three phase induction motor

T2 Three phase induction motor construction encompassing:

- basic component parts of a three-phase induction motor.
- types of rotors used in three-phase induction motors.
- connecting three-phase induction motor in both star and delta.
- dismantling three-phase induction motors.
- testing insulation resistance of a three-phase induction motor prior to connection to the supply.
- testing winding resistance (ohmic value and continuity) of a three-phase induction motor prior to connection to the supply

T3 Three phase induction motor characteristics encompassing:

- relationship between torque, speed, and power and interpretation of speed/torque curves of induction motors.
- squirrel cage motors operating characteristics conditions necessary for an induction motor to produce maximum torque.
- operating characteristics of an induction motor from name plate information and by measurement.
- induction motors efficiency and minimum energy performance standards (MEPS).
- full load efficiency and power factor of induction motors.

T4 Single phase motors – split phase encompassing:

- common types of single phase motor.
- principles of operation of a split phase induction motor.
- construction and basic characteristics of a split phase induction motor.
- applications of split phase induction motors.
- connecting, running and reversing a split phase induction motor.

T5 Single phase motors – capacitor and shaded pole types encompassing:

- identification of single phase induction motors including capacitor start, capacitor start/capacitor run, permanent split capacitor (PSC) and shaded pole
- principles of operation of each motor type listed above.

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REQUIRED SKILLS AND KNOWLEDGE

- operating characteristics and typical applications of each motor type listed above.
- connection and running each type of motor listed.
- reversing the direction of rotation of each of the capacitor type motors.

T6 Single phase motors – universal encompassing:

- principles of operation of a series universal motor.
- identification and functions of each of the basic parts of a series universal motor.
- operating characteristics and typical uses for a series universal motor.
- connecting, running and reversing a series universal motor.

T7 Motor protection encompassing:

- reasons why motor protection is required.
- requirements of the AS/NZS3000 Wiring rules with regards to motor protection.
- types of motor overload protection.
- operating principles of microtherm devices, thermal and magnetic motor protection devices.
- electrical features of motor protection HRC fuses.
- effects of under voltage and over voltage on motors and motor circuits.
- effects of repetitive starting and/or reversing on motors.
- special requirements for motor protection, in high humidity or moist environments, high temperature areas and corrosive atmospheres.
- operating principles of phase failure protection.
- selecting suitable protective devices for a given motor and starter combination.

T8 Three phase synchronous machines- operation principles and construction encompassing:

- power transfer diagram of an a.c. synchronous machine.
- need for the generation of a sinusoidal waveform.
- principles of operation of a synchronous alternator.
- principles of operation of a synchronous motor.
- principles of operation of an asynchronous generator (induction generator).
- identification of main parts of a synchronous alternator/motor.
- methods used to provide the excitation of a synchronous alternator/motor.
- block diagram of an alternator voltage regulator.
- advantages gained by the parallel operation of alternators.
- starting methods of synchronous motors.

T9 Alternators and generators encompassing:

- effects on the generated voltage of variations in excitation.
- effects on generated voltage of variations in load.
- identification of characteristic curves of an alternator.
- types of prime movers used with single and three phase portable/standby alternators.
- manual operation of single and three phase portable/standby alternators.

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REQUIRED SKILLS AND KNOWLEDGE

- ratings of single and three phase portable/standby alternators.
- applications of single and three phase portable/standby alternators.
- construction details of single and three phase portable/standby alternators.
- common faults found in portable/standby alternators.

Evidence Guide

EVIDENCE GUIDE

9) The evidence guide provides advice on assessment and must be read in conjunction with the Performance Criteria, Required Skills and Knowledge, the Range Statement and the Assessment Guidelines for this Training Package.

The Evidence Guide forms an integral part of this unit. It must be used in conjunction with all parts of this unit and performed in accordance with the Assessment Guidelines of this Training Package.

Overview of Assessment

9.1)

Longitudinal competency development approaches to assessment, such as Profiling, require data to be reliably gathered in a form that can be consistently interpreted over time. This approach is best utilised in Apprenticeship programs and reduces assessment intervention. It is the Industry's preferred model for apprenticeships. However, where summative (or final) assessment is used it is to include the application of the competency in the normal work environment or, at a minimum, the application of the competency in a realistically simulated work environment. It is recognised that, in some circumstances, assessment in part or full can occur outside the workplace. However, it must be in accordance with industry and regulatory policy.

Methods chosen for a particular assessment will be influenced by various factors. These include the extent of the assessment, the most effective locations for the assessment activities to take place, access to physical resources, additional safety measures that may be required and the critical nature of the competencies being assessed.

The critical safety nature of working with electricity, electrical equipment, gas or any other hazardous substance/material carries risk in deeming a person competent. Sources of evidence need to be 'rich' in nature to minimise error in judgment.

Activities associated with normal every day work have a bearing on the decision as to how much and how detailed the data gathered will contribute to its 'richness'. Some skills are more critical to safety and

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operational requirements while the same skills may be more or less frequently practised. These points are raised for the assessors to consider when choosing an assessment method and developing assessment instruments. Sample assessment instruments are included for Assessors in the Assessment Guidelines of this Training Package.

Critical aspects of evidence required to demonstrate competency in this unit

9.2)

Before the critical aspects of evidence are considered all prerequisites shall be met.

Evidence for competence in this unit shall be considered holistically. Each element and associated performance criteria shall be demonstrated on at least two occasions in accordance with the 'Assessment Guidelines - UEE07'. Evidence shall also comprise:

- A representative body of performance criteria demonstrated within the timeframes typically expected of the discipline, work function and industrial environment. In particular this shall incorporate evidence that shows a candidate is able to:
  - Implement Occupational Health and Safety workplace procedures and practices including the use of risk control measures as specified in the performance criteria and range statement
  - Apply sustainable energy principles and practices as specified in the performance criteria and range statement
  - Demonstrate an understanding of the essential knowledge and associated skills as described in this unit. It may be required by some jurisdictions that RTOs provide a percentile graded result for the purpose of regulatory or licensing requirements.
  - Demonstrate an appropriate level of skills enabling employment
  - Conduct work observing the relevant Anti Discrimination legislation, regulations, polices and workplace procedures
- Demonstrated consistent performance across a representative range of contexts from the prescribed items below:
  - Solve problems in single and three phase low voltage machines as described as described in 8) and including:

    A Determining the operating parameters of existing machines.

    B Altering an existing machine to comply with specified operating parameters.

    C Developing machines/circuits to comply with a

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specified function and operating parameters.

D Determining the cause of low efficiency in an existing machine.

E Determining conditions causing an existing circuit to be unsafe.

F Dealing with unplanned events

Context of and specific resources for assessment

9.3)

This unit should be assessed as it relates to normal work practice using procedures, information and resources typical of a workplace. This should include:

- OHS policy and work procedures and instructions.
- Suitable work environment, facilities, equipment and materials to undertake actual work as prescribed by this unit.

These should be part of the formal learning/assessment environment.

Note:

Where simulation is considered a suitable strategy for assessment, conditions must be authentic and as far as possible reproduce and replicate the workplace and be consistent with the approved industry simulation policy.

The resources used for assessment should reflect current industry practices in relation to solving problems in single and three phase low voltage machines.

Method of assessment

9.4)

This unit shall be assessed by methods given in Volume 1, Part 3 'Assessment Guidelines'.

Note: Competent performance with inherent safe working practices is expected in the industry to which this unit applies. This requires assessment in a structured environment which is primarily intended for learning/assessment and incorporates all necessary equipment and facilities for learners to develop and demonstrate the essential knowledge and skills described in this unit.

Concurrent assessment and relationship with other units

9.5)

There are no concurrent assessment recommendations for this unit.

The critical aspects of occupational health and safety covered in unit UEENEEE001B and other discipline specific occupational health

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and safety units shall be incorporated in relation to this unit.

Range Statement

RANGE STATEMENT

8) This relates to the unit as a whole providing the range of contexts and conditions to which the performance criteria apply. It allows for different work environments and situations that will affect performance.

This unit shall be demonstrated in relation to any four of the following problems in single and three-phase low voltage machine and circuits.

- Determining the operating parameters of existing machines
- Altering an existing machine circuit to comply with specified operating parameters
- Developing machine circuits to comply with a specified function and operating parameters

Note:
Operating parameters include voltage, current, torque, efficiency, power, energy and power factor

- Determining the cause of low efficiency in an existing machine.
- Determining problems in existing machines to malfunction

Note:
Problems include bearing noise/faults, vibration, undervoltage, unbalanced windings

- Determining conditions causing an existing machine/circuit to be unsafe.

Note:
Examples of unsafe circuits includes electric shock hazard from indirect contract with conductive parts, insufficiently low impedance of a fault current path and inadequate fault protection

Generic terms used throughout this Vocational Standard shall be regarded as part of the Range Statement in which competency is demonstrated. The definition of these and other terms that apply are given in Volume 2, Part 2.1.

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Unit Sector(s)

Not Applicable

Competency Field

2.2) Literacy and numeracy skills

Participants are best equipped to achieve competency in this unit if they have reading, writing and numeracy skills indicated by the following scales. Description of each scale is given in Volume 2, Part 3 'Literacy and Numeracy'

Reading	5	Writing	5	Numeracy	5

2.2) Literacy and numeracy skills

Competency Field **5)**

Electrical

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UEENEEG033A Solve problems in single and three phase low voltage electrical apparatus and circuits

Modification History

Not Applicable

Unit Descriptor

Unit Descriptor **1**)

1.1) **Descriptor**

This unit covers ascertaining correct operation of single and three phase low voltage electrical apparatus and circuits and solving circuit problems as they apply to servicing, fault finding, installation and compliance work functions. It encompasses safe working practices, apparatus circuit arrangements, issues related to operation, characteristics and protection and solutions to apparatus/circuit problems derived from calculated and measured parameters.

Application of the Unit

Not Applicable

Licensing/Regulatory Information

1.2) **License to practice**

During Training: Competency development activities are subject to regulations directly related to licencing, occupational health and safety and where applicable contracts of training such as apprenticeships.

In the workplace: The application of the skills and knowledge described in this unit require a license to practice in the workplace where work is carried out on electrical equipment or installations which are designed to operate at voltages greater than 50 V a.c. or 120 V d.c.

Other conditions may apply under State and Territory legislative and regulatory requirements.

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Pre-Requisites

Prerequisite Unit(s) **2)**

2.1) Competencies

Granting competency in this unit shall be made only after competency in the following unit(s) has/have been confirmed.

UEENEEE101A	Apply Occupational Health and Safety regulations, codes and practices in the workplace
UEENEEE102A	Fabricate, dismantle, assemble of electrotechnology components
UEENEEE104A	Solve problems in d.c circuits
UEENEEE105A	Fix and secure electrotechnology equipment
UEENEEE107A	Use drawings, diagrams, schedules, standards, codes and specifications
UEENEEG101A	Solve problems in electromagnetic devices and related circuits
UEENEEG102A	Solve problems in low voltage a.c. circuit
UEENEEG106A	Terminate cables, cords and accessories for low voltage circuits

Employability Skills Information

Employability Skills **3)**

This unit contains Employability Skills

The required outcomes described in this unit of competency contain applicable facets of Employability Skills. The Employability Skills Summary of the qualification in which this unit of competency is packaged

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will assist in identifying Employability Skill requirements.

Application of the Unit

4)

4.1) **General Application**

This unit applies to all qualifications, competencies and/or Skill Sets which require an electrical licence.

4.2) **Importation**

RTOs wishing to import this unit into any qualification under the flexibility provisions of NQC Training Package Policy

Elements and Performance Criteria Pre-Content

6) Elements describe the essential outcomes of a unit of competency

Elements and Performance Criteria

ELEMENT	PERFORMANCE CRITERIA
1 Prepare to solve single and three phase low voltage electrical apparatus/ circuit problems.	1.1 OHS procedures for a given work area are identified, obtained and understood.
	1.2 Established OHS risk control measures and procedures in preparation for the work are followed.
	1.3 Safety hazards, which have not previously been identified, are noted and established risk control measures are implemented.
	1.4 The nature of the apparatus/circuit(s) problem is obtained from documentation or from work supervisor to establish the scope of work to be undertaken.
	1.5 Advice is sought from the work supervisor to ensure the work is coordinated effectively with others.

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ELEMENT	PERFORMANCE CRITERIA	
	1.6	Sources of materials that may be required for the work are established in accordance with established procedures.
	1.7	Tools, equipment and testing devices needed to carry out the work are obtained and checked for correct operation and safety.
2 Solve single and three phase low voltage electrical apparatus/circuit problems.	2.1	OHS risk control measures and procedures for carrying out the work are followed.
	2.2	The need to test or measure live is determined in strict accordance with OHS requirements and when necessary conducted within established safety procedures.
	2.3	Apparatus/circuits/plant is checked as being isolated where necessary in strict accordance OHS requirements and procedures.
	2.4	Established methods are used to solve apparatus/circuit problems from measure and calculated values as they apply to single and three-phase low voltage apparatus/circuit.
	2.5	Established methods for dealing with unexpected situations are discussed with appropriate person or persons and documented.
	2.6	Unexpected situations are dealt with safely and with the approval of an authorised person.
	2.7	Problems are solved without damage to apparatus, circuits, the surrounding environment or services and using sustainable energy practices.
3 Complete work and document problem solving activities.	3.1	OHS work completion risk control measures and procedures are followed.
	3.2	Work site is cleaned and made safe in accordance with established procedures.
	3.3	Justification for solutions used to solve apparatus/circuit problems is documented.
	3.4	Work completion is documented and an appropriate person or persons notified in accordance with

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ELEMENT **PERFORMANCE CRITERIA**

established procedures.

Required Skills and Knowledge

REQUIRED SKILLS AND KNOWLEDGE

7) This describes the essential skills and knowledge and their level, required for this unit.

Evidence shall show that knowledge has been acquired of safe working practices and solving problems in single and three phase low voltage electrical apparatus and circuits.

The knowledge and skills shall be contextualised to current industry standards, technologies and practices.

KS01-EG033A **Electrical apparatus and circuits**

Evidence shall show an understanding of electrical apparatus and circuits to an extent indicated by the following aspects:

T1 Lighting circuits – looping at the light/switch encompassing:

- the “loop at the light” method of wiring lighting circuits.
- the “loop at the switch” method of wiring lighting circuits
- wiring diagrams for the lighting circuit of an installation that incorporates one-way, two-way and two-way and intermediate switching of light points using the loop at the light/switch methods of TPS wiring.
- TPS cabling requirement for the loop at the light/switch circuit.
- installation methods of accessories and wiring for a lighting circuit incorporating one-way, two-way and two-way and intermediate switching of lighting points using the loop at the light/switch method of TPS wiring.
- correct operation of the install circuits including testing for correct compliance with Australian Standards.

T2 Circuits for socket outlets encompassing:

- the purpose of socket outlets.
- requirements concerning the polarity of switched socket outlets.
- correct cable size to supply 10 A, 15 A and 20 A socket outlets (single and three phase), for given installation conditions.
- number of socket outlets connected to a 16 A and 20 A circuit breaker.
- installation methods of a single phase socket outlet circuits.
- correct operation of the installed circuits including testing (dead testing only) for correct compliance with Australian Standards.

T3 Final sub-circuits and segregation encompassing:

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REQUIRED SKILLS AND KNOWLEDGE

- purpose of mixed circuits.
- circuit loading for a mixed circuit.
- purpose of segregation of circuits and the AS/NZS3000 requirements.
- Installation methods a single phase mixed circuits.
- correct operation of the installed circuits including testing for correct compliance with Australian Standards.

T4 Electrical heating control devices encompassing:

- methods of manual heat control.
- methods of automatic heat control.
- types and application for common thermostats.
- operation of common thermostats.
- sensitivity and differential of thermostats.
- testing of a thermostat (including differential and correct operation)
- applications of simmerstats (infinite controls).
- operation of a simmerstat.
- electronic heat control (phase control and zero voltage switching).

T5 Fixed electrical heating appliances encompassing:

- Terms: heat energy, temperature, specific heat capacity, thermal conductivity and thermal stability.
- determining the heat energy in joules and kWh in a simple heating process.
- methods of heat transfer.
- Determining the heat energy input and output of a heating process.
- connections to a two phase stove.
- operation of reverse cycle air conditioning.

T6 Electrical water heater operation encompassing:

- types of water heaters (instantaneous and storage) and their methods of control.
- intrinsic safety (pressure relief and thermal cut-out).
- testing of over temperature cut-out point of a thermostat.
- switchboard requirements to supply a controlled load water heater.
- internal circuit of a twin element water heater, and supply connections.
- tariffs employed by local supply authorities.
- solar heating system and its integration into an installation.

T7 Alternative supplies encompassing:

- reasons for the installation of alternative supplies.
- types of alternative supply systems.
- characteristics and operation of UPSs.
- Australian Standards and local requirements for safety services supply systems.

T8 Installation of batteries encompassing:

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REQUIRED SKILLS AND KNOWLEDGE

- common types of primary cells and secondary batteries and typical applications.
- terminal voltage of common primary cells and secondary cells.
- correct storage, handling and disposal techniques for cells and batteries.
- charge/discharge cycle for a secondary cell.
- effect of internal resistance on a secondary cell.
- state of charge of a secondary cell.
- installation of batteries as per AS/NZS3011
- commissioning procedures for various secondary batteries.
- safe working procedures when working with secondary cells and batteries.

T9 Fire protection – residential fire and smoke alarms encompassing:

- types of fire and smoke alarms.
- regulations and standards requirements regarding residential fire and smoke alarms.
- locations for residential fire and smoke alarms.
- wiring methods for residential fire and smoke alarms.
- operation of typical residential fire and smoke alarms

T10 Emergency and evacuation lighting and lighting control encompassing:

- factors and requirements of emergency and evacuation lighting concerning illumination levels, luminaire positioning and operating period.
- characteristics of maintained, non maintained and sustained emergency lighting systems.
- arrangement of batteries in point and central bank emergency lighting supply systems.
- lighting control methods

T11 Lighting concepts and incandescent lighting encompassing:

- basic concepts of lighting.
- terminology, principles and standards relevant to lighting (energy efficiency as per BCA new lamp types and permitted replacements and their efficacy)..
- basic types of luminaries.
- operation of an incandescent lamp.
- types of incandescent lamps.
- expected lamp life, colour rendering and efficacy for typical incandescent lamps.
- lighting layout in terms of visual comfort and relevant Australian standards

T12 Fluorescent low intensity discharge lighting encompassing:

- types of low intensity discharge lamps.
- expected lamp life, colour rendering and efficacy for typical types of low intensity discharge lamps.
- operation of low intensity discharge luminaires including their control equipment.
- Australian Standard and local requirements for low intensity discharge lighting.
- methods for satisfying Australian Standards and local supply authority requirements

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REQUIRED SKILLS AND KNOWLEDGE

regarding low intensity discharge lighting.

T13 High intensity discharge lighting encompassing:

- types of high intensity discharge lamps.
- expected lamp life, colour rendering and efficacy for typical types of high intensity discharge lamps.
- operation of high intensity discharge luminaires including their control equipment.
- Australian Standard and local requirements for high intensity discharge lighting.
- methods for satisfying Australian Standards and local supply authority requirements regarding high intensity discharge lighting.
- LED lighting and its applications.
- Neon, Argon and Xenon lighting and their applications.
- comparison of incandescent, low intensity discharge, high intensity discharge, LED and other types of lighting

Evidence Guide

EVIDENCE GUIDE

9) The evidence guide provides advice on assessment and must be read in conjunction with the Performance Criteria, Required Skills and Knowledge, the Range Statement and the Assessment Guidelines for this Training Package.

The Evidence Guide forms an integral part of this unit. It must be used in conjunction with all parts of this unit and performed in accordance with the Assessment Guidelines of this Training Package.

Overview of Assessment

9.1)

Longitudinal competency development approaches to assessment, such as Profiling, require data to be reliably gathered in a form that can be consistently interpreted over time. This approach is best utilised in Apprenticeship programs and reduces assessment intervention. It is the Industry's preferred model for apprenticeships. However, where summative (or final) assessment is used it is to include the application of the competency in the normal work environment or, at a minimum, the application of the competency in a realistically simulated work environment. It is recognised that, in some circumstances, assessment in part or full can occur outside the workplace. However, it must be in accordance with industry and regulatory policy.

Methods chosen for a particular assessment will be influenced by various factors. These include the extent of the assessment, the

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EVIDENCE GUIDE

most effective locations for the assessment activities to take place, access to physical resources, additional safety measures that may be required and the critical nature of the competencies being assessed.

The critical safety nature of working with electricity, electrical equipment, gas or any other hazardous substance/material carries risk in deeming a person competent. Sources of evidence need to be 'rich' in nature to minimise error in judgment.

Activities associated with normal every day work have a bearing on the decision as to how much and how detailed the data gathered will contribute to its 'richness'. Some skills are more critical to safety and operational requirements while the same skills may be more or less frequently practised. These points are raised for the assessors to consider when choosing an assessment method and developing assessment instruments. Sample assessment instruments are included for Assessors in the Assessment Guidelines of this Training Package.

Critical aspects of evidence required to demonstrate competency in this unit

9.2)

Before the critical aspects of evidence are considered all prerequisites shall be met.

Evidence for competence in this unit shall be considered holistically. Each element and associated performance criteria shall be demonstrated on at least two occasions in accordance with the 'Assessment Guidelines - UEE07'. Evidence shall also comprise:

- A representative body of performance criteria demonstrated within the timeframes typically expected of the discipline, work function and industrial environment. In particular this shall incorporate evidence that shows a candidate is able to:
  - Implement Occupational Health and Safety workplace procedures and practices including the use of risk control measures as specified in the performance criteria and range statement
  - Apply sustainable energy principles and practices as specified in the performance criteria and range statement
  - Demonstrate an understanding of the essential knowledge and associated skills as described in this unit. It may be required by some jurisdictions that RTOs provide a percentile graded result for the purpose of regulatory or licensing requirements.
  - Demonstrate an appropriate level of skills enabling employment

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- Conduct work observing the relevant Anti Discrimination legislation, regulations, polices and workplace procedures

- Demonstrated consistent performance across a representative range of contexts from the prescribed items below:
  - Solve problems in single and three phase low voltage electrical apparatus and circuits as described as described in 8) and including:

A Determining the operating parameters of existing apparatus/circuits.

B Altering an existing apparatus/circuit to comply with specified operating parameters.

C Developing apparatus/circuits to comply with a specified function and operating parameters.

D Determining the cause of low efficiency in an existing apparatus/circuit.

E Determining conditions causing an existing apparatus/circuit to be unsafe.

F Dealing with unplanned events

Context of and specific resources for assessment

9.3)

This unit should be assessed as it relates to normal work practice using procedures, information and resources typical of a workplace. This should include:

- OHS policy and work procedures and instructions.
- Suitable work environment, facilities, equipment and materials to undertake actual work as prescribed by this unit.

These should be part of the formal learning/assessment environment.

Note:

Where simulation is considered a suitable strategy for assessment, conditions must be authentic and as far as possible reproduce and replicate the workplace and be consistent with the approved industry simulation policy.

The resources used for assessment should reflect current industry practices in relation to solving problems in electromagnetic circuits.

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EVIDENCE GUIDE

Method of assessment	**9.4**) This unit shall be assessed by methods given in Volume 1, Part 3 'Assessment Guidelines'. Note: Competent performance with inherent safe working practices is expected in the industry to which this unit applies. This requires assessment in a structured environment which is primarily intended for learning/assessment and incorporates all necessary equipment and facilities for learners to develop and demonstrate the essential knowledge and skills described in this unit.
Concurrent assessment and relationship with other units	**9.5**) There are no concurrent assessment recommendations for this unit.

Range Statement

RANGE STATEMENT

8) This relates to the unit as a whole providing the range of contexts and conditions to which the performance criteria apply. It allows for different work environments and situations that will affect performance.

This unit shall be demonstrated in relation to any four types of problems for both single and three-phase apparatus and circuits and three types of circuit/equipment as listed below.

Type of problems

- Determining the operating parameters of existing apparatus/circuit
- Altering an existing apparatus/circuit to comply with specified operating parameters
- Developing apparatus/circuits to comply with a specified function and operating parameters

Note:
Operating parameters include voltage, current, efficiency, power, energy and power factor

- Determining the cause of low efficiency in an existing apparatus/circuit.
- Determining conditions causing an existing apparatus/circuit to be unsafe.

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RANGE STATEMENT

	Note: Examples of unsafe circuits includes electric shock hazard from indirect contract with conductive parts, insufficiently low impedance of a fault current path and inadequate fault protection
Types of circuits/equipment	• Lighting circuits • Power circuits • Rotating machines • Electrical heating • Lighting

Generic terms used throughout this Vocational Standard shall be regarded as part of the Range Statement in which competency is demonstrated. The definition of these and other terms that apply are given in Volume 2, Part 2.1.

Unit Sector(s)

Not Applicable

Competency Field

2.2) Literacy and numeracy skills

Participants are best equipped to achieve competency in this unit if they have reading, writing and numeracy skills indicated by the following scales. Description of each scale is given in Volume 2, Part 3 'Literacy and Numeracy'

Reading	4	Writing	4	Numeracy	4

2.2) Literacy and numeracy skills

Competency Field **5)**

Electrical

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UEENEEG063A Arrange circuits, control and protection for general electrical installations

Modification History

Release	Action	Core/Elective	Details	Points
3	Edit		Adjust Performance Criteria numbering that was previously missing	

Unit Descriptor

Unit Descriptor **1**)

1.1) Descriptor

This unit covers the arrangement and termination of circuits, control and protection devices and systems for electrical installations operating at voltages up to 1,000 V a.c. or 1,500 V d.c. It encompass knowledge and application of schemes for protection of persons and property, correct functioning, ensuring compatibility with the supply, arranging installation into circuits and selecting and arranging switchgear/controlgear and protective devices to meet compliance requirements and documenting arrangement decisions.

Application of the Unit

Not Applicable

Licensing/Regulatory Information

1.2) License to practice

The application of the skills and knowledge described in this unit require a license to practice in the workplace where work is carried out on electrical equipment or installations which are designed to operate at voltages greater than 50 V a.c. or 120 V d.c.

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1.2) License to practice

Practice in workplace and during training is also subject to regulations directly related to occupational health and safety and where applicable contracts of training such as apprenticeships.

Note:
1. Compliance with permits may be required in various jurisdictions and typically relates to the operation of plant, machinery and equipment such as elevating work platforms, powder operated fixing tools, power operated tools, vehicles, road signage and traffic control and lifting equipment. Permits may also be required for some work environments such as confined spaces, working aloft, near live electrical apparatus and site rehabilitation.
2. Compliance may be required in various jurisdictions relating to currency in First Aid, confined space, lifting and risk safety measures.

Pre-Requisites

Prerequisite Unit(s) **2)**

2.1) Competencies

Granting competency in this unit shall be made only after competency in the following unit(s) has/have been confirmed.

UEENEEE101A	Apply Occupational Health and Safety regulations, codes and practices in the workplace
UEENEEE102A	Fabricate, dismantle, assemble of electrotechnology components
UEENEEE104A	Solve problems in d.c circuits
UEENEEE105A	Fix and secure electrotechnolgy equipment
UEENEEE107A	Use drawings, diagrams, schedules, standards, codes and specifications
UEENEEG101A	Solve problems in electromagnetic devices and related circuits
UEENEEG102A	Solve problems in low voltage a.c. circuit

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Prerequisite Unit(s) **2)**

UEENEEG106A	Terminate cables, cords and accessories for low voltage circuits

Employability Skills Information

Employability Skills **3)**

This unit contains Employability Skills

The required outcomes described in this unit of competency contain applicable facets of Employability Skills. The Employability Skills Summary of the qualification in which this unit of competency is packaged will assist in identifying Employability Skill requirements.

Application of the Unit **4)**

4.1) General Application

This unit applies to competency development entry-level employment based programs incorporated in approved contracts of training.

4.2) Importation

RTOs wishing to import this unit into any qualification under the flexibility provisions of NQC Training Package Policy

Elements and Performance Criteria Pre-Content

6) Elements describe the essential outcomes of a unit of competency

Elements and Performance Criteria

ELEMENT	PERFORMANCE CRITERIA

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ELEMENT	PERFORMANCE CRITERIA
1 Prepare to arrange electrical installations circuits, control and protection	1.1 The extent and nature of the electrical installation is determined from job specifications.
	1.2 Safety and other regulatory requirements to which the electrical installation shall comply are identified, obtained and understood.
	1.3 Load requirements for individual current-using equipment is determined from job specifications or from consultation with appropriate persons.
2 Arrange electrical installations circuits, control and protection	2.1 Circuits, control and protective devices are arranged to ensure safe and functional operation of the installation and to comply with technical standards and job specifications and requirements.
	2.2 Earthing is arranged and terminated to comply with the MEN system requirements.
	2.3 Protective devices are selected to meet the required switching and tripping currents, co-ordination and discrimination for overload and short-circuit protection.
	2.4 Residual current devices are selected to meet the required circuit, switching and tripping currents required.
	2.5 Switchgear/control gear is selected to meet current, voltage and IP ratings and functional requirements.
	2.6 Switchboards are arranged to accommodate control and protective devices, links, safety services, and other distributor equipment in accordance with requirements.
3 Document electrical installation circuits, control and protection arrangements	3.1 Evidence is obtained from manufacturers/suppliers that electrical equipment selected complies with safety requirements.
	3.2 Reasons for selections made, including calculations, are documented in accordance with established procedures.

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ELEMENT	PERFORMANCE CRITERIA
	3.3 Electrical installation arrangement and specifications for all selected items are documented in accordance with established procedures and forwarded to appropriate person(s).

Required Skills and Knowledge

REQUIRED SKILLS AND KNOWLEDGE

7) This describes the essential skills and knowledge and their level, required for this unit.

Evidence shall show that knowledge has been acquired of arranging electrical installations circuits, control and protection.

All knowledge and skills detailed in this unit should be contextualised to current industry practices and technologies.

KS01-EG063A Electrical installations — arrangement, control and protection

Evidence shall show an understanding of circuit arrangements, control and protection of electrical installations that comply with the Wiring Rules and Service Rules to an extent indicated by the following aspects:

T1 Safety principles to which electrical systems in building and premises shall comply.

- Safety principles are given in Part1 (Section 1) of the Wiring Rules AS/NZS 3000 with deemed-to-comply requirements given in Sections 2 to 8.
- Compliant methods for providing protection - include those for providing protection against direct and indirect contact; thermal effects; unwanted voltages; overcurrent; fault currents; overload; overvoltage; injury from mechanical movement.
- Requirements for installation design and selection of equipment - includes compliant protection arrangements; correct functioning; compatibility with supply; estimation of maximum demands; voltage drop considerations; arrangement of circuits and the like

T2 Circuit and control arrangements encompassing:

- reason for dividing electrical installations into circuits
- factors that shall be considered in determining the number and type of circuits required for an installation.
- daily and seasonal demand for lighting power, heating and other loads in a given installation.

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REQUIRED SKILLS AND KNOWLEDGE

- number and types of circuits required for a particular installation.
- diagrams/schedules of circuits for given installations.
- application and arrangements of SELV and PELV circuits
- application and arrangement of an isolated supply

T3 Hazards and risks in an electrical installation encompassing:

- effects on the human body of various levels of a.c. and d.c. current and duration of current flow for various current paths.
- risk of ignition of flammable materials due the thermal effects of current or electric arcs in normal service of an electrical installation.
- risk of injury from mechanical movement of electrically actuated equipment.
- Protection against direct contact (basic protection)
- acceptable methods
- use of extra-low voltage

T4 Protection against indirect contact encompassing:

- indirect contact with live parts of an electrical installation may occur.
- methods and devices that comply with the Wiring Rules for providing protection against indirect contact.
- components of the 'automatic disconnection of supply' method of protection against indirect contact.
- the terms ‘touch voltage’ and ‘touch current’.
- the current path when a short circuit fault to exposed conductive parts of an appliance occurs.
- protection against indirect contact is by the use of Class II equipment and by electrical separation.
- additional protection by use of Residual Current Devices (RCDs)
- protection against indirect contact by use of extra-low voltage and electrical separation.
- Protection requirements for damp situations.

T5 Earthing encompassing:

- the terms: earthed, earthed situation, earth electrode, equipotential bonding, multiple earthed neutral (MEN) system, protective earth-neutral (PEN) conductor, main earthing conductor, protective earthing (PE) conductor, functional earthing, MEN link.
- selection of minimum size-earthing conductor for a range of active conductor sizes and materials.
- parts of an earthing system and the purpose of each.
- typical arrangement for a MEN earthing system.
- arrangements of protective earthing conductors that comply with the Wiring Rules.
- requirements for equipotential bonding in a range of installation situations.
- Installation of a MEN earthing system for a single phase installation

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REQUIRED SKILLS AND KNOWLEDGE

T6 Protection against overload and short circuit current encompassing:

- overload current or fault currents in an electrical installation.
- equivalent circuit of an earth fault-loop
- level of fault current possible at a given point in an installation from the fault-loop impedance and data from the electricity distributor.
- methods and devices that comply with the Wiring Rules AS/NZS 3000 for providing protection against the damaging effects of overload and fault current
- requirements for co-ordination between protective devices and conductors
- requirements for co-ordination of protection devices for discrimination and back-up protection.

T7 Devices for automatic disconnection of supply encompassing:

- operating principles of thermal/magnet circuit breakers.
- operating principles of common types of fuses.
- operating principles of residual current devices (RCD).
- time/current curves tripping characteristics of various types of circuit breakers that comply with the requirements of the Wiring Rules.
- time/current curves fusing characteristics of various types of fuses that comply with the requirements of the Wiring Rules.
- time/current curves tripping characteristics of various types of RCDs that comply with the requirements of the Wiring Rules.
- factors in a fault loop that will affect the impedance of the circuit.
- maximum impedance of an earth fault-loop to ensure operating of a protection device.
- selecting a fuse for fault current limiting protection.
- drawing switchboard wiring arrangements of 2-pole RCDs, 4-pole RCDs, combination RCD/MCBs.

T8 Protection against over voltage and under voltage encompassing:

- causes of over voltage and how this may affect the electrical system.
- methods for protection against over voltage.
- causes of under voltage and how this may affect the electrical system.
- methods for protection against under voltage.

T9 Control of an electrical installation and circuits encompassing:

- switch types, current and voltage ratings and IP rating and where these apply.
- switching requirements for isolation, emergency, mechanical maintenance and functional control.
- control arrangement for complete installations with and without safety services and an alternative supply.

T10 Switchboards / distribution boards encompassing:

- Purpose, types and applications.

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REQUIRED SKILLS AND KNOWLEDGE

- Physical and circuit arrangements for whole current and CT metering.
- Physical and circuit arrangements of main switches, circuit protection devices, fault-current limiters and metering equipment and other distributor equipment.
- compliance requirements (includes location and access, arc fault protection, identification, construction suitability, equipment marking, wiring, fire protection and arc-fault protection).

Evidence Guide

EVIDENCE GUIDE

9) The evidence guide provides advice on assessment and must be read in conjunction with the Performance Criteria, Required Skills and Knowledge, the Range Statement and the Assessment Guidelines for this Training Package.

The Evidence Guide forms an integral part of this unit. It must be used in conjunction with all parts of this unit and performed in accordance with the Assessment Guidelines of this Training Package.

Overview of Assessment

9.1)

Longitudinal competency development approaches to assessment, such as Profiling, require data to be reliably gathered in a form that can be consistently interpreted over time. This approach is best utilised in Apprenticeship programs and reduces assessment intervention. It is the Industry's preferred model for apprenticeships. However, where summative (or final) assessment is used it is to include the application of the competency in the normal work environment or, at a minimum, the application of the competency in a realistically simulated work environment. It is recognised that, in some circumstances, assessment in part or full can occur outside the workplace. However, it must be in accordance with industry and regulatory policy.

Methods chosen for a particular assessment will be influenced by various factors. These include the extent of the assessment, the most effective locations for the assessment activities to take place, access to physical resources, additional safety measures that may be required and the critical nature of the competencies being assessed.

The critical safety nature of working with electricity, electrical equipment, gas or any other hazardous substance/material carries risk in deeming a person competent. Sources of evidence need to be 'rich' in nature to minimise error in judgment.

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EVIDENCE GUIDE

Activities associated with normal every day work have a bearing on the decision as to how much and how detailed the data gathered will contribute to its 'richness'. Some skills are more critical to safety and operational requirements while the same skills may be more or less frequently practised. These points are raised for the assessors to consider when choosing an assessment method and developing assessment instruments. Sample assessment instruments are included for Assessors in the Assessment Guidelines of this Training Package.

Critical aspects of evidence required to demonstrate competency in this unit

9.2)

Before the critical aspects of evidence are considered all prerequisites shall be met.

Evidence for competence in this unit shall be considered holistically. Each element and associated performance criteria shall be demonstrated on at least two occasions in accordance with the 'Assessment Guidelines - UEE07'. Evidence shall also comprise:

- A representative body of performance criteria demonstrated within the timeframes typically expected of the discipline, work function and industrial environment. In particular this shall incorporate evidence that shows a candidate is able to:
  - Implement Occupational Health and Safety workplace procedures and practices including the use of risk control measures as specified in the performance criteria and range statement
  - Apply sustainable energy principles and practices as specified in the performance criteria and range statement
  - Demonstrate an understanding of the essential knowledge and associated skills as described in this unit. It may be required by some jurisdictions that RTOs provide a percentile graded result for the purpose of regulatory or licensing requirements.
  - Demonstrate an appropriate level of skills enabling employment
  - Conduct work observing the relevant Anti Discrimination legislation, regulations, polices and workplace procedures
- Demonstrated consistent performance across a representative range of contexts from the prescribed items below:
  - arranging electrical installations circuits, control and protection as described as described in 8) and including:

    A Determining the extent and nature of the installation for

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EVIDENCE GUIDE

job specifications

B Obtaining and understand the safety and other regulatory requirements to which the electrical installation shall comply

C Determining individual load requirements.

D Arranging and terminate circuits, control and protective devices to comply with all requirements

E Selecting circuit protective devices residual current device that comply with all requirements.

F Selecting switchgear and control gear that meet current, voltage and IP ratings and functional requirements.

G Obtaining evidence of compliance for the equipment selected

H Documenting installation arrangement, specification for items selected and reasons for the selections made.

I Dealing with unplanned events

Context of and specific resources for assessment

9.3)

This unit should be assessed as it relates to normal work practice using procedures, information and resources typical of a workplace. This should include:

- OHS policy and work procedures and instructions.
- Suitable work environment, facilities, equipment and materials to undertake actual work as prescribed by this unit.

These should be part of the formal learning/assessment environment.

Note:

Where simulation is considered a suitable strategy for assessment, conditions must be authentic and as far as possible reproduce and replicate the workplace and be consistent with the approved industry simulation policy.

The resources used for assessment should reflect current industry practices in relation to arranging circuits, control and protection for general electrical installations.

Method of

9.4)

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EVIDENCE GUIDE

assessment	This unit shall be assessed by methods given in Volume 1, Part 3 'Assessment Guidelines'. Note: Competent performance with inherent safe working practices is expected in the industry to which this unit applies. This requires assessment in a structured environment which is primarily intended for learning/assessment and incorporates all necessary equipment and facilities for learners to develop and demonstrate the essential knowledge and skills described in this unit.
Concurrent assessment and relationship with other units	**9.5**) For optimisation of training and assessment effort, competency development in this unit may be arranged concurrently with unit: UEENEEG107A Select wiring systems and cables for low voltage general electrical installations

Range Statement

RANGE STATEMENT

8) This relates to the unit as a whole providing the range of contexts and conditions to which the performance criteria apply. It allows for different work environments and situations that will affect performance.

This unit shall be demonstrated in relation to arranging of circuits, control and protection for at least two general electrical installations comprising a main switchboard, supplying more than one circuit each for, lighting, socket outlets, and fixed appliances. One of the installations shall include a distribution board separate from the main switchboard and at least one circuit supplying a three-phase load and a fire pump.

Generic terms used throughout this Vocational Standard shall be regarded as part of the Range Statement in which competency is demonstrated. The definition of these and other terms that apply are given in Volume 2, Part 2.1.

Unit Sector(s)

Not Applicable

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Competency Field

2.2) Literacy and numeracy skills

Participants are best equipped to achieve competency in this unit if they have reading, writing and numeracy skills indicated by the following scales. Description of each scale is given in Volume 2, Part 3 'Literacy and Numeracy'

Reading	4	Writing	4	Numeracy	4

2.2) Literacy and numeracy skills

Competency Field **5)**

Electrical

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UEENEEG101A Solve problems in electromagnetic devices and related circuits

Modification History

Not Applicable

Unit Descriptor

Unit Descriptor **1**)

1.1) **Descriptor**

This unit covers determining correct operation of electromagnetic devices and related circuits and providing solutions as they apply to electrical installations and equipment. It encompasses working safely, power circuit problems solving processes, including the use of voltage, current and resistance measuring devices, providing solutions derived from measurements and calculations to predictable problems in electromagnetic devices and related circuits.

Application of the Unit

Not Applicable

Licensing/Regulatory Information

1.2) **License to practice**

During Training: Competency development activities are subject to regulations directly related to licencing, occupational health and safety and where applicable contracts of training such as apprenticeships.

In the workplace: The application of the skills and knowledge described in this unit require a license to practice in the workplace where work is carried out on electrical equipment or installations which are designed to operate at voltages greater than 50 V a.c. or 120 V d.c.

Other conditions may apply under State and Territory legislative and regulatory requirements.

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Pre-Requisites

Prerequisite Unit(s) **2)**

2.1) Competencies

Granting competency in this unit shall be made only after competency in the following unit(s) has/have been confirmed.

UEENEEE101A	Apply Occupational Health and Safety regulations, codes and practices in the workplace
UEENEEE104A	Solve problems in d.c circuits

Employability Skills Information

Employability Skills **3)**

This unit contains Employability Skills

The required outcomes described in this unit of competency contain applicable facets of Employability Skills. The Employability Skills Summary of the qualification in which this unit of competency is packaged will assist in identifying Employability Skill requirements.

Application of the Unit **4)**

4.1) General Application

This unit applies to all qualifications, competencies and/or Skill Sets which require an electrical licence.

4.2) Importation

RTOs wishing to import this unit into any qualification under the flexibility provisions of NQC Training Package Policy

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Elements and Performance Criteria Pre-Content

6) Elements describe
the essential outcomes
of a unit of competency

Elements and Performance Criteria

ELEMENT		PERFORMANCE CRITERIA	
1	Prepare to work on electromagnetic devices and circuits.	1.1	OHS procedures for a given work area are identified, obtained and understood.
		1.2	OHS risk control work preparation measures and procedures are followed.
		1.3	The nature of the device(s)/circuit(s) problem is obtained from documentation or from work supervisor to establish the scope of work to be undertaken.
		1.4	Advice is sought from the work supervisor to ensure the work is coordinated effectively with others.
		1.5	Sources of materials that may be required for the work are established in accordance with established procedures.
		1.6	Tools, equipment and testing devices needed to carry out the work are obtained and checked for correct operation and safety.
2	Solve electromagnetic devices/circuit problems.	2.1	OHS risk control work measures and procedures are followed.
		2.2	The need to test or measure live is determined in strict accordance with OHS requirements and when necessary conducted within established safety procedures.
		2.3	Circuits are checked as being isolated where necessary in strict accordance OHS requirements and procedures.
		2.4	Established methods are used to solving circuit problems from measure and calculated values as they apply to electromagnetic devices/circuits.

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ELEMENT	PERFORMANCE CRITERIA	
	2.5	Unexpected situations are dealt with safely and with the approval of an authorised person.
	2.6	Problems are solved without damage to apparatus, circuits, the surrounding environment or services and using sustainable energy practices.
3 Complete work and document problem solving activities.	3.1	OHS work completion risk control measures and procedures are followed.
	3.2	Work site is cleaned and made safe in accordance with established procedures.
	3.3	Justification for solutions used to solve circuit problems is documented.
	3.4	Work completion is documented and an appropriate person or persons notified in accordance with established procedures.

Required Skills and Knowledge

REQUIRED SKILLS AND KNOWLEDGE

7) This describes the essential skills and knowledge and their level, required for this unit.

Evidence shall show that knowledge has been acquired of safe working practices and solving problems in electromagnetic devices and related circuits.

The knowledge and skills shall be contextualised to current industry standards, technologies and practices.

KS01-EG101A Electromagnetic devices and circuits

Evidence shall show an understanding of electromagnetic devices and circuits to an extent indicated by the following aspects:

T1 Magnetism encompassing:

- magnetic field pattern of bar and horse-shoe magnets.
- magnets attraction and repulsion when brought in contact with each other.
- common magnetic and non-magnetic materials and groupings (diamagnetic, paramagnetic and ferromagnetic materials).
- principle of magnetic screening (shielding) and its applications.
- practical applications of magnets

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REQUIRED SKILLS AND KNOWLEDGE

- construction, operation and applications of reed switches.

T2 Electromagnetism encompassing:

- conventions representing direction of current flow in a conductor.
- magnetic field pattern around a single conductor and two adjacent conductors carrying current.
- Using the “right hand rule” to determine the direction of magnetic field around a current carrying conductor.
- direction of force between adjacent current carrying conductors.
- effect of current, length and distance apart on the force between conductors (including forces on bus bars during fault conditions).
- magnetic field around an electromagnet.
- Using the “right hand rule” to determine the direction of magnetic field around a current carrying coil.
- magnetomotive force (m.m.f.) and its relationship to the number of turns in a coil and the current flowing in the coil.
- practical applications of electromagnets.

T3 Magnetic circuits encompassing:

- magnetic characteristic curve for various materials and identify the various regions.
- Identify the various conditions of a magnetic material from its Hysteresis loop.
- factors which determine losses in magnetic material.
- methods used to reduce electrical losses in a magnetic circuit.
- magnetic flux (definition, unit and symbol).
- reluctance as the opposition to the establishment of magnetic flux.
- permeability (definition, symbol and unit).
- difference for magnetic and non-magnetic materials in regards to reluctance and permeability.
- calculation of m.m.f., flux or reluctance given any two values.
- flux density (definition, symbol, unit and calculation).
- magnetising force (definition, symbol, unit and calculation).
- common magnetic circuit types.
- effect of an air gap in a magnetic circuit.
- terms “magnetic leakage” and “magnetic fringing”.

T4 Electromagnetic induction encompassing:

- principle of electromagnetic induction (Faraday’s law of electromagnetic induction).
- applying “Fleming’s right hand rule” to a current a carrying conductor under the influence of a magnetic field.
- calculation of induced e.m.f. in a conductor given the conductor length, flux density and velocity of the conductor.
- calculation of induced e.m.f. in a coil given the number of turns in a coil and the rate of change of flux.

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REQUIRED SKILLS AND KNOWLEDGE

- calculation of force on a conductor given the flux density of the magnetic field, length of the conductor and the current being carried by the conductor.
- Lenz's law
- applications of electromagnetic induction

T5 Inductance encompassing:

- construction of an inductor, including a bifilar winding inductor.
- Australian Standard circuit diagram symbol for the four types of inductor.
- effect of physical parameters on the inductance of an inductor.
- common types of inductor cores.
- applications of the different types of inductors.
- definition of terms self induction, inductance and mutual inductance.
- calculation of value of self induced e.m.f. in a coil.
- mutual induction occurs between two coils.
- graphical relationship between load voltage, current and self induced e.m.f. in a single d.c. circuit having inductance.
- practical applications for the effects of self and mutual induction.
- undesirable effects of self and mutual induction.
- definition of term "time constant" and draw the characteristic curve as applied to a series circuit containing an inductor and a resistor. (LR circuit)Calculation of value of the time constant for an LR circuit given the values of the components.
- time constants required for the current in an LR circuit to reach its final value.
- determining of instantaneous values of voltage and current in an LR circuit using a universal time constant chart.

T6 Measurement Instruments encompassing:

- moving coil, moving iron, dynamometer meter movements and clamp testers.
- practical applications for moving coil, moving iron and dynamometer meter movements.
- Calculation of resistance of shunts and multipliers to extend the range of ammeters and voltmeters.
- factors to be considered in selecting meters for a particular application.
- safety category of meters and their associated applications.
- steps and procedures for the safe use, care and storage of electrical instruments.

T7 Magnetic devices encompassing:

- construction, operation and applications of relays.
- construction, operation and applications of contactors.
- magnetic methods used to extinguish the arc between opening contacts.
- construction, operation and applications of Hall Effect devices.
- operation and applications of magnetostriction equipment.
- construction, operation and application of magnetic sensing devices.

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REQUIRED SKILLS AND KNOWLEDGE

T8 Machine principles encompassing:

- basic operating principle of a generator.
- applying Fleming's right hand rule for generators.
- basic operating principle of a motor.
- applying Fleming's left hand rule for motors.
- calculation of force and torque developed by a motor.

T9 Rotating machine construction, testing and maintenance encompassing:

- components of a d.c. machine.
- difference between a generator and a motor in terms of energy conversion.
- nameplate of a machine.
- using electrical equipment to make electrical measurements and comparison of readings with nameplate ratings.
- Identification of faults in a machine from electrical measurements.
- care and maintenance processes for rotating machines
- safety risks associated with using rotating machinery.

T10 Generators encompassing:

- basic operation of a d.c generator.
- calculation of generated and terminal voltage of a d.c. shunt generator
- prime movers, energy sources and energy flow used to generate electricity.
- types of d.c. generators and their applications.
- methods of excitation used for d.c generators.
- equivalent circuit for a d.c. generator.
- importance of residual magnetism for a self excited generator.
- open circuit characteristics of d.c. generators.
- load characteristics of a d.c generator.
- reversing the polarity of a d.c. generator
- Connect and test a d.c generator on no-load and load
- Identify safety risks associated with using generators.

T11 Motors encompassing:

- operation of a motor and its energy flow.
- effect of back e.m.f. in d.c. motors
- torque as the product of the force on the conductors and the radius of the armature/rotor.
- types of d.c. motors and their applications.
- circuit diagrams for the types of d.c. motors.
- equivalent circuit for the types of d.c. motors.
- calculation of power output of a motor.
- characteristics of the different types of d.c. motors.
- connection and testing a d.c. shunt motor on no-load and load

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REQUIRED SKILLS AND KNOWLEDGE

- reversing the direction of rotation of a d.c. motor.
- safety risks associated with using motors (include risks of series d.c. motors).

T12 Machine efficiency encompassing:

- losses that occur in a d.c machine.
- methods used to determine the losses in a d.c. machine.
- calculation of losses and efficiency of a d.c machine.
- efficiency characteristic of a d.c. machine and the conditions for maximum efficiency.
- application of Minimum Energy Performance standards (MEPS).
- methods used to maintain high efficiency.

Evidence Guide

EVIDENCE GUIDE

9) The evidence guide provides advice on assessment and must be read in conjunction with the Performance Criteria, Required Skills and Knowledge, the Range Statement and the Assessment Guidelines for this Training Package.

The Evidence Guide forms an integral part of this unit. It must be used in conjunction with all parts of this unit and performed in accordance with the Assessment Guidelines of this Training Package.

Overview of Assessment

9.1)

Longitudinal competency development approaches to assessment, such as Profiling, require data to be reliably gathered in a form that can be consistently interpreted over time. This approach is best utilised in Apprenticeship programs and reduces assessment intervention. It is the Industry's preferred model for apprenticeships. However, where summative (or final) assessment is used it is to include the application of the competency in the normal work environment or, at a minimum, the application of the competency in a realistically simulated work environment. It is recognised that, in some circumstances, assessment in part or full can occur outside the workplace. However, it must be in accordance with industry and regulatory policy.

Methods chosen for a particular assessment will be influenced by various factors. These include the extent of the assessment, the most effective locations for the assessment activities to take place, access to physical resources, additional safety measures that may be required and the critical nature of the competencies being assessed.

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EVIDENCE GUIDE

The critical safety nature of working with electricity, electrical equipment, gas or any other hazardous substance/material carries risk in deeming a person competent. Sources of evidence need to be 'rich' in nature to minimise error in judgment.

Activities associated with normal every day work have a bearing on the decision as to how much and how detailed the data gathered will contribute to its 'richness'. Some skills are more critical to safety and operational requirements while the same skills may be more or less frequently practised. These points are raised for the assessors to consider when choosing an assessment method and developing assessment instruments. Sample assessment instruments are included for Assessors in the Assessment Guidelines of this Training Package.

Critical aspects of evidence required to demonstrate competency in this unit

9.2)

Before the critical aspects of evidence are considered all prerequisites shall be met.

Evidence for competence in this unit shall be considered holistically. Each element and associated performance criteria shall be demonstrated on at least two occasions in accordance with the 'Assessment Guidelines - UEE07'. Evidence shall also comprise:

- A representative body of work performance demonstrated within the timeframes typically expected of the discipline, work function and industrial environment. In particular this shall incorporate evidence that shows a candidate is able to:
  - Implement Occupational Health and Safety workplace procedures and practices including the use of risk control measures as specified in the performance criteria and range statement
  - Apply sustainable energy principles and practices as specified in the performance criteria and range statement
  - Demonstrate an understanding of the essential knowledge and associated skills as described in this unit. It may be required by some jurisdictions that RTOs provide a percentile graded result for the purpose of regulatory or licensing requirements.
  - Demonstrate an appropriate level of skills enabling employment
  - Conduct work observing the relevant Anti Discrimination legislation, regulations, polices and workplace procedures
- Demonstrated consistent performance across a representative range of contexts from the prescribed items below:

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EVIDENCE GUIDE

- Solve problems in electromagnetic circuits as described as described in 8) and including:

A Using methodological techniques to solve problems in circuits with an electromagnetic device from measure and calculated values

B Determining the operating parameters of an existing circuit with an electromagnetic device.

C Alternating an existing circuit with an electromagnetic device to comply with specified operating parameters.

D Developing circuits with electromagnetic devices to comply with a specified function and operating parameters.

E Dealing with unplanned events

Context of and specific resources for assessment

9.3)

This unit should be assessed as it relates to normal work practice using procedures, information and resources typical of a workplace. This should include:

- OHS policy and work procedures and instructions.
- Suitable work environment, facilities, equipment and materials to undertake actual work as prescribed by this unit.

These should be part of the formal learning/assessment environment.

Note:

Where simulation is considered a suitable strategy for assessment, conditions must be authentic and as far as possible reproduce and replicate the workplace and be consistent with the approved industry simulation policy.

The resources used for assessment should reflect current industry practices in relation to solving problems in electromagnetic devices and related circuits.

Method of assessment

9.4)

This unit shall be assessed by methods given in Volume 1, Part 3 'Assessment Guidelines'.

Note:
Competent performance with inherent safe working practices is expected in the industry to which this unit applies. This requires

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EVIDENCE GUIDE

	assessment in a structured environment which is primarily intended for learning/assessment and incorporates all necessary equipment and facilities for learners to develop and demonstrate the essential knowledge and skills described in this unit.
Concurrent assessment and relationship with other units	**9**.**5**) For optimisation of training and assessment effort, competency development in this unit may be arranged concurrently with unit:

Range Statement

RANGE STATEMENT

8) This relates to the unit as a whole providing the range of contexts and conditions to which the performance criteria apply. It allows for different work environments and situations that will affect performance.

This unit shall be demonstrated in relation to solving problems in electromagnetic devices and related circuits by:

- Determining the operating parameters of an existing circuits with electromagnetic devices
- Altering an existing circuit with an electromagnetic device to comply with specified operating parameters
- Developing circuit with an electromagnetic device to comply with a specified function and operating parameters

AND

In relation to the following on more than one occasions:

Solving problems

- Connecting circuits,
- Using methodological problem solving techniques,
- Solving electromagnetic device problems,
- Demonstrate an understanding of the behaviour of current and voltage in circuits with electromagnetic devices
- Calculating circuit parameters accurately,

Circuit and device testing

- Choose correct instruments and ranges for testing,
- Connect meters to measure parameters in circuits with

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RANGE STATEMENT

electromagnetic devices,

and

At least four of the following electromagnetic devices

- Reed switches
- Solenoids
- Relays
- Contactors
- Inductive limit switches
- Bells
- Lifting magnets
- Core balance devices
- Magnetic overloads
- Motors
- Generators
- Magnetic brakes
- Magnetic circuit breakers

Generic terms used throughout this Vocational Standard shall be regarded as part of the Range Statement in which competency is demonstrated. The definition of these and other terms that apply are given in Volume 2, Part 2.1.

Unit Sector(s)

Not Applicable

Competency Field

2.2) Literacy and numeracy skills

Participants are best equipped to achieve competency in this unit if they have reading, writing and numeracy skills indicated by the following scales. Description of each scale is given in Volume 2, Part 3 'Literacy and Numeracy'

Reading	4	Writing	4	Numeracy	4

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2.2) Literacy and numeracy skills

Competency Field **5**)

Electrical

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UEENEEG102A Solve problems in low voltage a.c. circuits

Modification History

Not Applicable

Unit Descriptor

Unit Descriptor **1**)

1.1) Descriptor

This unit covers ascertaining correct operation of single and three phase a.c. circuits and solving circuit problems as they apply to servicing, fault finding, installation and compliance work functions. It encompasses safe working practices, multiphase circuit arrangements, issues related to protection, power factor and MEN systems and solutions to circuit problems derived from calculated and measured parameters.

Application of the Unit

Not Applicable

Licensing/Regulatory Information

1.2) License to practice

During Training: Competency development activities are subject to regulations directly related to licencing, occupational health and safety and where applicable contracts of training such as apprenticeships.

In the workplace: The application of the skills and knowledge described in this unit require a license to practice in the workplace where work is carried out on electrical equipment or installations which are designed to operate at voltages greater than 50 V a.c. or 120 V d.c.

Other conditions may apply under State and Territory legislative and regulatory requirements.

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Pre-Requisites

Prerequisite Unit(s) **2)**

2.1) Competencies

Granting competency in this unit shall be made only after competency in the following unit(s) has/have been confirmed.

UEENEEE101A	Apply Occupational Health and Safety regulations, codes and practices in the workplace
UEENEEE104A	Solve problems in d.c circuits
UEENEEG101A	Solve problems in electromagnetic devices and related circuits

Employability Skills Information

Employability Skills **3)**

This unit contains Employability Skills

The required outcomes described in this unit of competency contain applicable facets of Employability Skills. The Employability Skills Summary of the qualification in which this unit of competency is packaged will assist in identifying Employability Skill requirements.

Application of the Unit **4)**

4.1) General Application

This unit applies to all qualifications, competencies and/or Skill Sets which require an electrical licence.

4.2) Importation

RTOs wishing to import this unit into any qualification under the flexibility provisions of NQC Training Package Policy

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Elements and Performance Criteria Pre-Content

6) Elements describe
the essential outcomes
of a unit of competency

Elements and Performance Criteria

ELEMENT		PERFORMANCE CRITERIA	
1	Prepare to solve low voltage a.c. circuit problems.	1.1	OHS procedures for a given work area are identified, obtained and understood.
		1.2	Established OHS risk control measures and procedures in preparation for the work are followed.
		1.3	Safety hazards, which have not previously been identified, are noted and established risk control measures are implemented.
		1.4	The nature of the circuit(s) problem is obtained from documentation or from work supervisor to establish the scope of work to be undertaken.
		1.5	Advice is sought from the work supervisor to ensure the work is coordinated effectively with others.
		1.6	Sources of materials that may be required for the work are established in accordance with established procedures.
		1.7	Tools, equipment and testing devices needed to carry out the work are obtained and checked for correct operation and safety.
2	Solve low voltage a.c. circuit problems.	2.1	OHS risk control measures and procedures for carrying out the work are followed.
\		2.2	The need to test or measure live is determined in strict accordance with OHS requirements and when necessary conducted within established safety procedures.
		2.3	Circuits/machines/plant are checked as being isolated where necessary in strict accordance OHS requirements and procedures.

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ELEMENT	PERFORMANCE CRITERIA	
	2.4	Established methods are used to solve circuit problems from measure and calculated values as they apply to single and three-phase low voltage circuit.
	2.5	Unexpected situations are dealt with safely and with the approval of an authorised person.
	2.6	Problems are solved without damage to apparatus, circuits, the surrounding environment or services and using sustainable energy practices.
3 Complete work and document problem solving activities.	3.1	OHS work completion risk control measures and procedures are followed.
	3.2	Work site is cleaned and made safe in accordance with established procedures.
	3.3	Justification for solutions used to solve circuit problems is documented.
	3.4	Work completion is documented and an appropriate person or persons notified in accordance with established procedures.

Required Skills and Knowledge

REQUIRED SKILLS AND KNOWLEDGE

7) This describes the essential skills and knowledge and their level, required for this unit.

Evidence shall show that knowledge has been acquired of safe working practices and Solving single and three phase low voltage circuit problems.

All knowledge and skills detailed in this unit should be contextualised to current industry practices and technologies.

KS01-EG102A Alternating current power circuits

Evidence shall show an understanding of alternating currents power circuits to an extent indicated by the following aspects:

T1 Alternating Current Quantities encompassing:

- sine, cosine and tangent ratios of a right angle triangle
- Pythagoras Theorem to a right angle triangle.
- use of the CRO to measure d.c. and a.c. voltage levels

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REQUIRED SKILLS AND KNOWLEDGE

- sinusoidal voltage generated by a single turn coil rotated in a uniform magnetic fields
- terms 'period', 'maximum value', 'peak-to-peak value', 'instantaneous value', 'average value', 'root-mean-square (r.m.s.) value', in relation to a sinusoidal waveform.
- calculation of the instantaneous value of induced voltage of a generated sinusoidal waveform.
- measurement of instantaneous, peak, peak-to-peak values and the period of a sinusoidal waveform.
- calculation of root-mean-square (r.m.s.) value and frequency of a sinusoidal waveform from values of peak voltage and period.

T2 Phasors Diagrams encompassing:

- purpose of phasor diagrams
- 'in-phase', 'out-of-phase', 'phase angle'' lead' and 'lag'.
- phase angle between two or more alternating quantities from a given sinusoidal waveform diagram.
- convention for representing voltage, current and the reference quantity in a phasor diagram.
- drawing phasor diagrams to show the relationship between two or more a.c. values of voltage and/or current.
- determination of phase relationship between two or more sinusoidal waveforms from a given diagram and measurements.

T3 Single Element a.c. circuits encompassing:

- setting up and connect a single-source resistive a.c. circuit and take voltage and current measurements to determine the resistance
- determining the voltage, current resistances from measure of given values of any tow of these qualities.
- relationship between voltage drops and current in resistive a.c. circuit
- applications of resistive a.c. circuits
- defining ‘inductive reactance’.
- calculation of inductive reactance for a given inductor and the relationship between inductive reactance and frequency.
- applying Ohm’s Law to determine voltage, current of inductive reactance in a purely inductive a.c. circuit given any two to these quantities.
- applications of inductive a.c circuits.
- calculation of capacitive reactance
- applying Ohm’s Law to determine voltage, current or capacitive reactance in a purely capacitive a.c circuit given any two of the quantities.
- applications of capacitive a.c circuits

T4 RC and RL Series a.c. circuits encompassing:

- impedance and impedance triangle.
- determining the impedance, current and voltages for a series RC circuit given the resistance, capacitance and supply voltage.

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REQUIRED SKILLS AND KNOWLEDGE

- drawing and labelling the impedance triangle for a series RC circuit
- drawing phasor diagrams for a series RC circuit
- AS/NZS 3000 requirements for the installation of capacitors.
- examples of capacitive components in power circuits and systems and the effect on the phase relationship between voltage and current.
- determining the impedance, current and voltages for a series RL circuit given the resistance, inductance and supply voltage.
- drawing and labelling the impedance triangle for a series RL circuit
- drawing the equivalent circuit of a practical inductor
- Draw phasor diagrams for a series RL circuit.
- examples of inductive components in power circuits and systems and describe their effect on the phase relationship between voltage and current

T5 RLC Series a.c. circuits encompassing:

- measuring component voltages in a series RLC circuit and using a phasor diagram to determine the supply voltage and phase angle between circuit voltage and circuit current.
- determining the impedance, current and voltages for a series RLC circuit given resistance, inductance, capacitance and supply voltage.
- drawing and labelling the impedance triangle for a series RLC circuit.
- calculation of total impedance for a series RLC circuit.
- calculation of voltage drop for cables using the values for reactance and a.c. resistance from AS/NZS 3008.
- comparison of current limiting characteristics of inductors and resistors.
- practical examples of RLC series circuits

T6 Parallel a.c. Circuits encompassing:

- determining the branch currents of a parallel circuit that contain RL, RC or LC in two branches.
- using a phasor diagram to determine the total circuit current and phase angle in parallel RL, RC or LC circuits.
- determining the total circuit impedance of parallel RL, RC or LC circuits.
- measuring the branch currents in a parallel RLC circuit and use a phasor diagram to determine the total current and phase angle between circuit voltage and circuit current.
- determining the branch impedances, branch currents and phase angles voltages for a parallel RLC circuit given resistance, inductance, capacitance and supply voltage.
- calculation of impedance for a parallel RLC circuit.
- practical examples of parallel circuits.

T7 Power in an a.c. circuit encompassing:

- difference between true power, apparent power and reactive power and the units in which these quantities are measured.
- drawing the power triangle to show the relationships between true power, apparent

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REQUIRED SKILLS AND KNOWLEDGE

power and reactive power
- defining the term "power factor" and phase angle.
- methods used to measure single phase power, energy and demand.

T8 Power Factor Improvement encompassing:

- effects of low power factor.
- requirements for power factor improvement.
- methods used to improve low power factor of an installation.
- local supply authority and AS/NZS 3000 wiring rules requirements regarding the power factor of an installation and power factor improvement equipment.
- methods used to measure single phase power factor.
- using manufacturers catalogues to select power factor equipment for a particular installation

T9 Harmonics and Resonance Effect in a.c. Systems encompassing:

- term "harmonic" in relation to the sinusoidal waveform of an a.c. power system.
- sources in a.c. systems that produce harmonics.
- problems that may arise in a.c. circuits as a result of harmonics and how these are overcome.
- methods and test equipment used to test for harmonics
- methods used to reduce harmonics in a.c. power system
- conditions in a series a.c. circuit that produce resonance.
- dangers of series resonance circuits
- conditions in a parallel a.c. circuit that produce resonance.
- dangers of parallel resonance circuits
- AS/NZS3000 and the local supply authority requirements concerning harmonics and resonance effect in a.c. power systems.

T10 Three Phase Systems encompassing:

- features of a multiphase system.
- comparison of voltages generated by single and multiphase alternators.
- reasons for the adoption of three phases for power systems.
- how three phases is generated in a single alternator.
- Calculation of r.m.s. value of voltage generated in each phase given the maximum value.
- relationship between the phase voltages generated in a three phase alternator and the conventions for identifying each.
- term "phase sequence" (also, referred to as "phase rotation").
- determining the phase sequence of a three phase supply

T11 Three phase star-connections encompassing:

- connecting a three phase star-connection load.
- phase relationship between line and phase voltages and line and phase currents of a

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REQUIRED SKILLS AND KNOWLEDGE

star-connected system.
- determining the r.m.s. value of line and phase voltage given any one of these quantities.
- determining the r.m.s. value of line and phase current given any one of these quantities.
- terms "balanced load" and "unbalanced load".
- effect of a reversed phase winding of a star connected alternator.
- example of balanced and unbalanced loads in typical power systems.

T12 Three phase four wire systems encompassing:

- purpose of the neutral conductor in a three phase four wire systems.
- determining the effects of an high impedance in the neutral conductor of a three phase four wire system supplying an unbalanced load where MEN earthing is employed.
- determining the value and phase relationship of neutral current in an unbalanced three phase four wire systems given line currents and power factors.
- AS/NZS 3000 requirements regarding neutral conductors.
- AS/NZS 3008.1.1 method for determining voltage drop in unbalanced three phase circuits

T13 Three phase delta-connections and Interconnected systems encompassing:

- connecting three phase delta loads.
- phase relationship between line and phase voltages and line and phase currents of a delta-connected system.
- determining the r.m.s. value of line and phase voltage given any one of these quantities.
- determining the r.m.s. value of line and phase current given any one of these quantities.
- limitations and uses of open delta connections
- effect of a reversed phase winding of a delta connected transformer
- example of loads in typical power systems.
- drawing the typical combinations of three phase interconnected systems using star-connections and a delta-connection.
- relationship between line and phase voltages and line and phase currents in the typical interconnected systems using star-connections and delta-connections.

T14 Energy and power requirements of a.c. systems encompassing:

- purposes for measuring power, energy, power factor and maximum demand of a.c. power systems and loads.
- difference between true power, apparent power and reactive power and the units in which these quantities are measured in a three phase system.
- drawing the power triangle to show the relationships between true power, apparent power and reactive power in a three phase system.
- methods used to measure three phase power , energy, power factor and demand.
- determining how the power factor of a three phase installation can be improved.
- using manufacturers catalogues to select measurement equipment for a particular installation

T15 Fault Loop Impedance encompassing:

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REQUIRED SKILLS AND KNOWLEDGE

- term fault loop impedance of a a.c. power system
- determining fault loop impedance using resistance and reactance values from AS/NZS 3008.1.1
- measuring fault loop impedance of typical circuits
- procedures for testing fault loop impedance

Evidence Guide

EVIDENCE GUIDE

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The Evidence Guide forms an integral part of this unit. It must be used in conjunction with all parts of this unit and performed in accordance with the Assessment Guidelines of this Training Package.

Overview of Assessment

9.1)

Longitudinal competency development approaches to assessment, such as Profiling, require data to be reliably gathered in a form that can be consistently interpreted over time. This approach is best utilised in Apprenticeship programs and reduces assessment intervention. It is the Industry's preferred model for apprenticeships. However, where summative (or final) assessment is used it is to include the application of the competency in the normal work environment or, at a minimum, the application of the competency in a realistically simulated work environment. It is recognised that, in some circumstances, assessment in part or full can occur outside the workplace. However, it must be in accordance with industry and regulatory policy.

Methods chosen for a particular assessment will be influenced by various factors. These include the extent of the assessment, the most effective locations for the assessment activities to take place, access to physical resources, additional safety measures that may be required and the critical nature of the competencies being assessed.

The critical safety nature of working with electricity, electrical equipment, gas or any other hazardous substance/material carries risk in deeming a person competent. Sources of evidence need to be 'rich' in nature to minimise error in judgment.

Activities associated with normal every day work have a bearing on the decision as to how much and how detailed the data gathered will

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EVIDENCE GUIDE

contribute to its 'richness'. Some skills are more critical to safety and operational requirements while the same skills may be more or less frequently practised. These points are raised for the assessors to consider when choosing an assessment method and developing assessment instruments. Sample assessment instruments are included for Assessors in the Assessment Guidelines of this Training Package.

Critical aspects of evidence required to demonstrate competency in this unit

9.2)

Before the critical aspects of evidence are considered all prerequisites shall be met.

Evidence for competence in this unit shall be considered holistically. Each element and associated performance criteria shall be demonstrated on at least two occasions in accordance with the 'Assessment Guidelines - UEE07'. Evidence shall also comprise:

- A representative body of work performance demonstrated within the timeframes typically expected of the discipline, work function and industrial environment. In particular this shall incorporate evidence that shows a candidate is able to:
  - Implement Occupational Health and Safety workplace procedures and practices including the use of risk control measures as specified in the performance criteria and range statement
  - Apply sustainable energy principles and practices as specified in the performance criteria and range statement
  - Demonstrate an understanding of the essential knowledge and associated skills as described in this unit. It may be required by some jurisdictions that RTOs provide a percentile graded result for the purpose of regulatory or licensing requirements.
  - Demonstrate an appropriate level of skills enabling employment
  - Conduct work observing the relevant Anti Discrimination legislation, regulations, polices and workplace procedures
- Demonstrated consistent performance across a representative range of contexts from the prescribed items below:
  - Solve problems in single and three phase circuits as described as described in 8) and including:

    A Using methodological techniques to solve problems in circuits in a.c. circuits from measure and calculated values

    B Determining the operating parameters of existing circuits

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C Altering an existing circuit to comply with specified operating parameters.

D Developing circuits to comply with a specified function and operating parameters.

E Determining the cause of low power factor in an existing circuit.

F Determining conditions causing an existing circuit to be unsafe.

G Dealing with unplanned events

Context of and specific resources for assessment

9.3)

This unit should be assessed as it relates to normal work practice using procedures, information and resources typical of a workplace. This should include:

- OHS policy and work procedures and instructions.
- Suitable work environment, facilities, equipment and materials to undertake actual work as prescribed by this unit.

These should be part of the formal learning/assessment environment.

Note:

Where simulation is considered a suitable strategy for assessment, conditions must be authentic and as far as possible reproduce and replicate the workplace and be consistent with the approved industry simulation policy.

The resources used for assessment should reflect current industry practices in relation to solving single and three phase low voltage circuit problems.

Method of assessment

9.4)

This unit shall be assessed by methods given in Volume 1, Part 3 'Assessment Guidelines'.

Note: Competent performance with inherent safe working practices is expected in the industry to which this unit applies. This requires assessment in a structured environment which is primarily intended for learning/assessment and incorporates all necessary equipment and facilities for learners to develop and demonstrate the essential knowledge and skills described in this unit.

Concurrent

9.5)

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assessment and relationship with other units	For optimisation of training and assessment effort, competency development in this unit may be arranged concurrently with unit:

Range Statement

RANGE STATEMENT

8) This relates to the unit as a whole providing the range of contexts and conditions to which the performance criteria apply. It allows for different work environments and situations that will affect performance.

This unit shall be demonstrated in relation to solving problems in a.c. circuit by:

- Determining the operating parameters of existing circuits
- Altering an existing circuit to comply with specified operating parameters
- Developing circuits to comply with a specified function and operating parameters of voltage, current, impedance, power and power factor
- Determining the cause of low power factor in an existing circuit.
- Determining conditions causing an existing circuit to be unsafe includes electric shock hazard from indirect contract with conductive parts, insufficiently low impedance of a fault current path and inadequate fault protection.

In relation to the following on more than one occasions:

Single phase circuits

- Connecting single-phase circuits
- Choosing correct instruments
- Taking measurements correctly and accurately.

Three-phase circuits

- Connecting three-phase circuits
- Choosing correct instruments
- Taking measurements correctly and accurately.

AND

At least four of the following applications

- Series a.c. circuits
- Parallel a.c. circuits

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RANGE STATEMENT

- Series / parallel a.c. circuits
- Single phase motors / controls
- Three phase motors / controls
- Synchronous machines
- Transformers / Auxiliary components
- Star connected circuits
- Delta connected circuits
- Star-Delta interconnected circuits
- Open Delta circuits

Generic terms used throughout this Vocational Standard shall be regarded as part of the Range Statement in which competency is demonstrated. The definition of these and other terms that apply are given in Volume 2, Part 2.1.

Unit Sector(s)

Not Applicable

Competency Field

2.2) Literacy and numeracy skills

Participants are best equipped to achieve competency in this unit if they have reading, writing and numeracy skills indicated by the following scales. Description of each scale is given in Volume 2, Part 3 'Literacy and Numeracy'

Reading	4	Writing	4	Numeracy	4

Custom Content Section

Competency Field **5)**

Electrical

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UEENEEG106A Terminate cables, cords and accessories for low voltage circuits

Modification History

Release	Action	Core/Elective	Details	Points
3	Edit		In Pre-requisites, edit code to reflect correct unit title UEENEEE107A Use drawings, diagrams, schedules, standards, codes and specifications	
3	Edit		In Pre-requisites, edit name to reflect correct unit title UEENEEE102A Fabricate, assemble and dismantle utilities industry components	

Unit Descriptor

Unit Descriptor **1**)

1.1) **Descriptor**

This unit covers the termination of cables and cords and their conductors at accessories and current-using devices designed to operate at voltages up to 1,000 V a.c. or 1,500 V d.c. It encompasses working safely and to standards, understanding wiring system and cable types and applications, selecting appropriate termination accessories, preparing and terminating cables and cords, terminating cables/cord conductors and ensuring completed termination complies with requirements.

Application of the Unit

Not Applicable

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Licensing/Regulatory Information

1.2) License to practice

During Training: Competency development activities are subject to regulations directly related to licensing, occupational health and safety and where applicable contracts of training such as apprenticeships.

In the workplace: The application of the skills and knowledge described in this unit require a license to practice in the workplace where work is carried out on electrical equipment or installations which are designed to operate at voltages greater than 50 V a.c. or 120 V d.c.

Other conditions may apply under State and Territory legislative and regulatory requirements.

Pre-Requisites

Prerequisite Unit(s) **2)**

2.1) Competencies

Granting competency in this unit shall be made only after competency in the following unit(s) has/have been confirmed.

UEENEEE101A	Apply Occupational Health and Safety regulations, codes and practices in the workplace
UEENEEE102A	Fabricate, assemble and dismantle utilities industry components
UEENEEE105A	Fix and secure electrotechnology equipment
UEENEEE107A	Use drawings, diagrams, schedules, standards, codes and specifications

Employability Skills Information

Employability Skills **3)**

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This unit contains Employability Skills

The required outcomes described in this unit of competency contain applicable facets of Employability Skills. The Employability Skills Summary of the qualification in which this unit of competency is packaged will assist in identifying Employability Skill requirements.

Application of the Unit **4)**

4.1) General Application

This unit applies to competency development entry-level employment based programs incorporated in approved contracts of training.

4.2) Importation

RTOs wishing to import this unit into any qualification under the flexibility provisions of NQC Training Package Policy

Elements and Performance Criteria Pre-Content

6) Elements describe the essential outcomes of a unit of competency

Elements and Performance Criteria

ELEMENT	PERFORMANCE CRITERIA
1 Prepare to terminate cables, cords and conductors	1.1 OHS procedures for a given work area are identified, obtained and understood.
	1.2 Health and safety risks are identified and established risk control measures and procedures in preparation for the work are followed.
	1.3 Safety hazards that have not previously been identified are noted and established risk control measures are implemented.

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ELEMENT		PERFORMANCE CRITERIA	
		1.4	The junction box/ terminal enclosures and terminal types are inspected to select the type and size of cable and conductor termination devices needed.
		1.5	Tools, materials and testing devices needed to for terminating cables and cords are obtained in accordance with established procedures and checked for correct operation and safety.
2	Terminate cables, cords and conductors	2.1	OHS risk control measures and procedures for carrying out the work are followed.
		2.2	Circuits/machines/plant are checked as being isolated where necessary in strict accordance OHS requirements and procedures.
		2.3	Cable/cord ends are cut and sheath/insulation stripped with sufficient length to prevent stain on terminations and without undue waste.
		2.4	Cable glands/retaining devices are fitted and secured to ensure cable/cord cannot be pulled out of entry into junction box/ terminal enclosure
.		2.5	Conductors are prepared to suit the type of terminal at which there are to be connected.
		2.6	Conductors are terminated to ensure continuity across the terminal.
		2.7	Established methods for dealing with unexpected situations are discussed with appropriate person or persons and documented.
		2.8	Unexpected situations are dealt with safely and with the approval of an authorised person.
3	Test terminated cables and cords	3.1	OHS work completion risk control measures and procedures are followed.
		3.2	Terminated cables are tested to ensure continuity and insulation resistance comply with requirements.

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Required Skills and Knowledge

REQUIRED SKILLS AND KNOWLEDGE

7) This describes the essential skills and knowledge and their level, required for this unit.

Evidence shall show that knowledge has been acquired of safe working practices and terminating cables, cords and accessories for low voltage circuits.

The knowledge and skills shall be contextualised to current industry standards, technologies and practices.

KS01-EG106A Wiring systems types, application and terminations

Evidence shall show an understanding of wiring systems types, application and terminations to an extent indicated by the following aspects:

T1 Cable types and terminations encompassing:

- cable variates (single cables, flexible cables, flexible cords, shielded cables, armoured cables, ribbon cables, other similar and like cables)
- structural components of cables and their purpose (conductor material, stranding, insulation type, voltage rating, screening, sheathing, armour and serving)
- Australian and International colour standards for cords and cables
- construction of common cables
- identification of cords and cables by conductor size, type and rating
- application of various cords and cables types
- identification of hardware used in terminating cords and cables
- preparation and termination of cords and cables
- termination of cords and cables using crimp lugs, tunnel connectors, soldering and solderless lugs
- requirements to protect and support cables adequately (protection against mechanical damage, protection from adverse temperatures and corrosion and protection from magnetic field that may affect the performance of the cable).

T2 Cords, cables and plugs encompassing:

- selection of flexible cords for given applications
- preparation of cord ends for connection
- fitting standard three pin plug tops to a flexible cords
- fitting standard three pin extension sockets to a flexible cords
- connecting variety of plugs to different flexible cord types
- requirements of AS/NZS 3000 for flexible cords, cables and plugs
- using test equipment to test and locate various faults in flexible cords and cables.

T3 Flat TPS wiring systems encompassing:

- Australian Standards requirements for the termination and protection of flat TPS cable

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REQUIRED SKILLS AND KNOWLEDGE

- Installation of flat TPS cable in trunking and duct for the supply of socket outlets
- using flat TPS cable for lighting looms
- testing circuits to ensure they are safe and operate as intended

T4 Circular TPS wiring systems encompassing:

- Australian Standards requirements for the installation of circular TPS cable
- installation of circular TPS cables on cable ladder/tray
- installation of circular TPS cable
- testing circuits to ensure they are safe and operate as intended

T5 Thermoplastic insulated cables in non-metallic enclosures encompassing:

- Australian Standards requirements for the installation of non-metallic enclosures
- cutting and setting rigid non-metallic ducting, trunking and conduit and accessories
- installation of circuits using TPI cables in non-metallic enclosures
- testing circuits to ensure they are safe and operate as intended

T6 Thermoplastic insulated cables in metallic enclosures encompassing:

- Australian Standards requirements for the installation of metallic enclosures
- fitting metallic conduit to metallic trunking and accessories
- cutting, threading and setting metallic conduit
- installation of circuits using thermoplastic insulated cables in metallic conduit, ducting and trunking
- testing circuits to ensure they are safe and operate as intended

T7 Fire protection cabling and systems encompassing:

- Australian Standards requirements for the installation of fire protection cable and mineral insulated metal sheathed cables
- requirements when passing a wiring system through a fire rated wall or floor
- recognising different fire protection cable types including Pyrolex, Radox and MIMS
- termination of fire protection cable.
- installation of circuits using fire protection cable.
- testing circuits to ensure they are safe and operate as intended

T8 Steel wire armoured (SWA) cables encompassing:

- Australian Standards requirements for the installation of SWA cables
- identifying accessories used with SWA cables
- installation of circuits using SWA cables
- testing circuits to ensure they are safe and operate as intended

T9 Trailing cables and catenary systems encompassing:

- Australian Standards requirements for the installation of trailing cables and catenary wiring

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REQUIRED SKILLS AND KNOWLEDGE

- identifying equipment used with trailing cable and catenary systems
- installation of catenary wiring systems
- installation of trailing cable systems supplying pendant sockets
- testing the installation to ensure it is safe and operates as intended

Evidence Guide

EVIDENCE GUIDE

9) The evidence guide provides advice on assessment and must be read in conjunction with the Performance Criteria, Required Skills and Knowledge, the Range Statement and the Assessment Guidelines for this Training Package.

The Evidence Guide forms an integral part of this unit. It must be used in conjunction with all parts of this unit and performed in accordance with the Assessment Guidelines of this Training Package.

Overview of Assessment

9.**1**)

Longitudinal competency development approaches to assessment, such as Profiling, require data to be reliably gathered in a form that can be consistently interpreted over time. This approach is best utilised in Apprenticeship programs and reduces assessment intervention. It is the Industry's preferred model for apprenticeships. However, where summative (or final) assessment is used it is to include the application of the competency in the normal work environment or, at a minimum, the application of the competency in a realistically simulated work environment. It is recognised that, in some circumstances, assessment in part or full can occur outside the workplace. However, it must be in accordance with industry and regulatory policy.

Methods chosen for a particular assessment will be influenced by various factors. These include the extent of the assessment, the most effective locations for the assessment activities to take place, access to physical resources, additional safety measures that may be required and the critical nature of the competencies being assessed.

The critical safety nature of working with electricity, electrical equipment, gas or any other hazardous substance/material carries risk in deeming a person competent. Sources of evidence need to be 'rich' in nature to minimise error in judgment.

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EVIDENCE GUIDE

Activities associated with normal every day work have a bearing on the decision as to how much and how detailed the data gathered will contribute to its 'richness'. Some skills are more critical to safety and operational requirements while the same skills may be more or less frequently practised. These points are raised for the assessors to consider when choosing an assessment method and developing assessment instruments. Sample assessment instruments are included for Assessors in the Assessment Guidelines of this Training Package.

Critical aspects of evidence required to demonstrate competency in this unit

9.2)

Before the critical aspects of evidence are considered all prerequisites shall be met.

Evidence for competence in this unit shall be considered holistically. Each element and associated performance criteria shall be demonstrated on at least two occasions in accordance with the 'Assessment Guidelines - UEE07'. Evidence shall also comprise:

- A representative body of work performance demonstrated within the timeframes typically expected of the discipline, work function and industrial environment. In particular this shall incorporate evidence that shows a candidate is able to:
  - Implement Occupational Health and Safety workplace procedures and practices including the use of risk control measures as specified in the performance criteria and range statement
  - Apply sustainable energy principles and practices as specified in the performance criteria and range statement
  - Demonstrate an understanding of the essential knowledge and associated skills as described in this unit. It may be required by some jurisdictions that RTOs provide a percentile graded result for the purpose of regulatory or licensing requirements.
  - Demonstrate an appropriate level of skills enabling employment
  - Conduct work observing the relevant Anti Discrimination legislation, regulations, polices and workplace procedures
- Demonstrated consistent performance across a representative range of contexts from the prescribed items below:

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EVIDENCE GUIDE

- Install wiring and accessories for low voltage circuits as described as described in 8) and including:

A Selecting appropriate cable/cord and conductor devices

B Cutting cable ends and stripping sheath/insulation to a sufficient length

C Fitting and securing cable glands/retaining devices correctly

D Preparing and terminating conducts to suit the type of terminal at which there are to be connected.

E Testing completed cables to ensure compliant continuity and insulation resistance

F Dealing with unplanned events

Context of and specific resources for assessment

9.3)

This unit should be assessed as it relates to normal work practice using procedures, information and resources typical of a workplace. This should include:

- OHS policy and work procedures and instructions.
- Suitable work environment, facilities, equipment and materials to undertake actual work as prescribed by this unit.

These should be part of the formal learning/assessment environment.

Note:

Where simulation is considered a suitable strategy for assessment, conditions must be authentic and as far as possible reproduce and replicate the workplace and be consistent with the approved industry simulation policy.

The resources used for assessment should reflect current industry practices in relation to installing wiring and accessories for low voltage circuits.

Method of assessment

9.4)

This unit shall be assessed by methods given in Volume 1, Part 3 'Assessment Guidelines'.

Note:

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EVIDENCE GUIDE

Competent performance with inherent safe working practices is expected in the industry to which this unit applies. This requires assessment in a structured environment which is primarily intended for learning/assessment and incorporates all necessary equipment and facilities for learners to develop and demonstrate the essential knowledge and skills described in this unit.

Concurrent assessment and relationship with other units

9.5)

Range Statement

RANGE STATEMENT

8) This relates to the unit as a whole providing the range of contexts and conditions to which the performance criteria apply. It allows for different work environments and situations that will affect performance.

This unit shall be demonstrated by terminating at least five different types of cables each at a junction box and a device terminal enclosure.

Cable types with copper conductors:

- Thermoplastic insulated cable (TPI)
- Flat thermoplastic sheathed (TPS)
- Circular thermoplastic sheathed (TPS)
- Steel wire armoured (SWA)
- Mineral insulated metal sheathed (MIMS)
- Flexible cables
- Flexible cords
- Aluminium conductor/cable

AND

Terminate their conductors at each of the follow

Terminal types

- Tunnel terminal
- Stud terminal

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RANGE STATEMENT

- Screw terminal

Generic terms used throughout this Vocational Standard shall be regarded as part of the Range Statement in which competency is demonstrated. The definition of these and other terms that apply are given in Volume 2, Part 2.1.

Unit Sector(s)

Not Applicable

Competency Field

2.2) Literacy and numeracy skills

Participants are best equipped to achieve competency in this unit if they have reading, writing and numeracy skills indicated by the following scales. Description of each scale is given in Volume 2, Part 3 'Literacy and Numeracy'

Reading	4	Writing	4	Numeracy	4

Custom Content Section

Competency Field **5)**

Electrical

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UEENEEG108A Trouble-shoot and repair faults in low voltage electrical apparatus and circuits

Modification History

Not Applicable

Unit Descriptor

Unit Descriptor **1**)

1.1) Descriptor

This unit covers trouble-shooting and repairing faults in electrical apparatus and interconnecting circuits and equipment operating at voltages up to 1,000 V a.c. or 1,500 V d.c. It encompasses working safely, reading circuit diagrams, sketching diagrams from traced wiring, logically applying fault finding procedures, conducting repairs and completing the necessary service documentation.

Application of the Unit

Not Applicable

Licensing/Regulatory Information

1.2) License to practice

During Training: Competency development activities are subject to regulations directly related to licensing, occupational health and safety and where applicable contracts of training such as apprenticeships.

In the workplace: The application of the skills and knowledge described in this unit require a license to practice in the workplace where work is carried out on electrical equipment or installations which are designed to operate at voltages greater than 50 V a.c. or 120 V d.c.

Other conditions may apply under State and Territory legislative and regulatory requirements.

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Pre-Requisites

Prerequisite Unit(s) **4)**

Competencies **4.1)**

Granting of competency in this unit shall be made only after competency in the following unit(s) has/have been confirmed.

Unit Code	Unit Title
UEENEEE101A	Apply Occupational Health and Safety regulations, codes and practices in the workplace
UEENEEE102A	Fabricate, dismantle, assemble of utilities components
UEENEEE104A	Solve problems in d.c. Circuits
UEENEEE105A	Fix and secure electrotechnology equipment
UEENEEE107A	Use drawings, diagrams, schedules, standards, codes and specifications
UEENEEG006A	Solve problems in single and three phase low voltage machines
UEENEEG033A	Solve problems in single and three phase electrical apparatus and circuits
UEENEEG063A	Arrange circuits, control and protection for general electrical installations
UEENEEG101A	Solve problems in electromagnetic devices and related circuits
UEENEEG102A	Solve problems in low voltage a.c. circuits
UEENEEG106A	Terminate cables, cords and accessories for low voltage circuits

2.2) Literacy and numeracy skills

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Participants are best equipped to achieve competency in this unit if they have reading, writing and numeracy skills indicated by the following scales. Description of each scale is given in Volume 2, Part 3 'Literacy and Numeracy'

Reading	4	Writing	4	Numeracy	4

Employability Skills Information

Employability Skills **3**)

This unit contains Employability Skills

The required outcomes described in this unit of competency contain applicable facets of Employability Skills. The Employability Skills Summary of the qualification in which this unit of competency is packaged will assist in identifying Employability Skill requirements.

Application of the Unit **4**)

4.1) **General Application**

This unit applies to all qualifications, competencies and/or Skill Sets which require an electrical license.

4.2) **Importation**

RTOs wishing to import this unit into any qualification under the flexibility provisions of NQC Training Package Policy

Elements and Performance Criteria Pre-Content

6) Elements describe the essential outcomes of a unit of competency

Elements and Performance Criteria

ELEMENT	PERFORMANCE CRITERIA	
1 Prepare to trouble-shoot and	1.1	The extent and nature of the electrical installation is determined from job

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ELEMENT	PERFORMANCE CRITERIA	
rectify faults.		specifications.
	1.2	Safety and other regulatory requirements to which the electrical installation shall comply area are identified, obtained and understood.
	1.3	OHS procedures for a given work area are identified, obtained and understood.
	1.4	OHS risk control measures and procedures in preparation for the work are followed.
	1.5	The likely extent of work to be undertaken is envisaged from fault/breakdown reports and/or discussions with appropriate person(s).
	1.6	Advice is sought from the work supervisor to ensure the work is coordinated effectively with others.
2 Trouble-shoot and repair faults.	2.1	OHS risk control measures and procedures for carrying out the work are followed.
	2.2	The need to test or measure live is determined in strict accordance with OHS requirements and when necessary conducted within established safety procedures.
	2.3	Circuits/machines/plant are checked as being isolated where necessary in strict accordance OHS requirements and procedures.
	2.4	Safety hazards resulting from the fault or breakdown are documented and risk control measures devised and implemented in consultation with appropriate personnel.
	2.5	Trouble-shooting is approached methodically drawing on knowledge of electrical circuits and apparatus using measured and calculated values of circuit/apparatus parameters.
	2.6	Circuit/apparatus components are dismantled where necessary and parts stored to protect them against loss or damage.
	2.7	Faulty circuits/components are rechecked and

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ELEMENT	PERFORMANCE CRITERIA	
		their fault status and acquired.
	2.8	Materials/replacement parts required to rectify faults are sourced and obtained in accordance with established procedures.
	2.9	Effectiveness of the repair is tested in accordance with established procedures.
	2.10	Apparatus is reassembled, finally tested and prepared for return to service.
	2.11	Unexpected situations are dealt with safely and with the approval of an authorised person.
	2.12	Trouble-shooting and repair activities are carried out without damage to apparatus, circuits, the surrounding environment or services and using sustainable energy practices.
3 Completion and report trouble-shoot and repair activities.	3.1	OHS work completion risk control measures and procedures are followed.
	3.2	Work area is cleaned and made safe in accordance with established procedures.
	3.3	Written justification is made for repairs to apparatus.
	3.4	Work completion is documented and an appropriate person or persons notified in accordance with established procedures.

Required Skills and Knowledge

REQUIRED SKILLS AND KNOWLEDGE

7) This describes the essential skills and knowledge and their level, required for this unit.

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REQUIRED SKILLS AND KNOWLEDGE

Evidence shall show that knowledge has been acquired of safe working practices and trouble-shooting and repairing faults in electrical apparatus and circuits.

All knowledge and skills detailed in this unit should be contextualised to current industry practices and technologies.

KS01-EG108A Electrical circuit and equipment faults and fault finding techniques

Evidence shall show an understanding of electrical circuit and equipment faults and fault finding techniques to an extent indicated by the following aspects:

T1 Troubleshooting concepts encompassing:

- need to understand the correct operation of a circuit or equipment, switching and control circuit arrangements.
- common faults with circuits and equipment including operator faults, incorrect connections, open-circuits, short-circuits, device faults (mechanical), supply faults.
- typical faults symptoms and their causes: operation of circuit protective device, appliance does not operate, single phase motor does not develop enough torque to drive the load, three phase motor does not develop enough torque to drive the load, motor overload trips
- factors to consider in clarifying the nature of a fault: initial fault report, confirmation of symptoms of the fault, comparison of symptoms with normal operation
- effect to cause reasoning — assumptions of possible causes
- methods for testing assumptions: visual inspection, component isolation, test equipment, sectional testing, split-half tests
- repairing the fault and the steps needed to ensure fault doesn’t re-occur
- dealing with intermittent faults (typical causes of intermittent faults are vibration, shock, changes in temperature and electromagnetic interference).
- final testing and re commissioning

T2 Troubleshooting water heater and appliance circuits/equipment encompassing:

- circuit diagrams of common single phase and three phase hot water systems
- single phase and three phase element resistance values (determined from measurement and calculation from power and voltage ratings)
- testing single and three phase elements for correct insulation resistance and continuity
- element replacement techniques
- operation of thermostats, thermal cut-outs and pressure relief valves, flow switches and checking sacrificial anodes
- locating faults in common single and three phase hot water systems
- repairing faulty water heating systems

T3 Troubleshooting electrical appliance circuits/equipment encompassing:

- circuit diagrams of common single phase and three phase appliances
- methods to determine the cause of an RCD operation

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REQUIRED SKILLS AND KNOWLEDGE

- identification of appliances that is causing an RCD to trip
- testing single and three phase appliances for correct insulation resistance and continuity
- operation of appliances controls
- locating faults in common single and three phase appliances
- repairing faulty appliances

T4 Troubleshooting lighting circuits encompassing:

- circuit and wiring diagrams of common lighting circuits including single light controlled by a single switch, multiple lights controlled by a single switch, two and three way switching using the loop at the light method and the loop at the switch method.
- causes of wiring faults from supplied symptoms and circuit and/or wiring diagrams
- causes of faults in ELV lighting devices, include transformer (iron core or electronic), voltage drop, heat, over-voltage, poor connections, incompatible dimmers
- diagrams of a basic fluorescent light circuit including lamp, ballast and starter
- locating faults in fluorescent light circuits
- operation of a range of lighting control including passive infra-red (PIR), dimmers, photo electric or day-light switches and time clocks
- locating faults in lighting control circuits

T5 Troubleshooting single phase motor and control circuits encompassing:

- circuit diagrams of split phase, capacitor start, capacitor start capacitor run, universal and shaded pole single phase motors
- causes of single phase motor faults from supplied symptoms and circuit diagrams
- causes of electrical faults in single phase motors, include open and partially open circuit winding, short and partially short circuit winding, open circuit rotor, burnt out winding, coil shorted to frame.
- reasons for a thermal overload trip and how often they are to be reset before investigating a cause
- internal mechanical faults and their consequences, include bearings, fans, bent shaft, locked rotor, blocked air vents, centrifugal switches, environmental factors
- faults on driven loads and couplings and their consequences, include slipping belts, poorly aligned coupling (shims), vibration, loads bearing failing, load stalling.
- locating faults in single phase motors and their controls

T6 Troubleshooting three phase induction motor encompassing:

- circuit diagrams of three phase induction motors
- causes of three phase motor faults from supplied symptoms and circuit diagrams
- causes of electrical faults in three phase motors, include open and partially open circuit phase winding, short and partially short circuit phase winding, open circuit rotor, burnt out phase winding, coil shorted to frame.
- reasons for a thermal overload trip and how often they are to be reset before investigating a cause
- internal mechanical faults and their consequences, include bearings, fans, bent shaft, locked rotor, blocked air vents, environmental factors.

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REQUIRED SKILLS AND KNOWLEDGE

- faults on driven loads and couplings and their consequences, include slipping belts, poorly aligned coupling (shims), vibration, loads bearing failing, load stalling.
- locating faults in three phase induction motors and their controls

T7 Troubleshooting electrical installations encompassing:

- circuit diagrams, wiring diagrams, cable schedules and specifications of electrical installations
- causes of electrical installation faults from supplied symptoms and circuit diagrams include open and partially open circuit wiring, short and partially short circuit wiring, low insulation resistance, incorrect polarity, transposition of conductors, RCD tripping.
- locating faults in electrical installations
- repairing faulty electrical installation circuits components and wiring.

Evidence Guide

EVIDENCE GUIDE

9) The evidence guide provides advice on assessment and must be read in conjunction with the Performance Criteria, Required Skills and Knowledge, the Range Statement and the Assessment Guidelines for this Training Package.

The Evidence Guide forms an integral part of this unit. It must be used in conjunction with all parts of this unit and performed in accordance with the Assessment Guidelines of this Training Package.

Overview of Assessment

9.1)

Longitudinal competency development approaches to assessment, such as Profiling, require data to be reliably gathered in a form that can be consistently interpreted over time. This approach is best utilised in Apprenticeship programs and reduces assessment intervention. It is the Industry's preferred model for apprenticeships. However, where summative (or final) assessment is used it is to include the application of the competency in the normal work environment or, at a minimum, the application of the competency in a realistically simulated work environment. It is recognised that, in some circumstances, assessment in part or full can occur outside the workplace. However, it must be in accordance with industry and regulatory policy.

Methods chosen for a particular assessment will be influenced by various factors. These include the extent of the assessment, the most effective locations for the assessment activities to take place, access to physical resources, additional safety measures that may be required

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EVIDENCE GUIDE

and the critical nature of the competencies being assessed.

The critical safety nature of working with electricity, electrical equipment, gas or any other hazardous substance/material carries risk in deeming a person competent. Sources of evidence need to be 'rich' in nature to minimise error in judgment.

Activities associated with normal every day work have a bearing on the decision as to how much and how detailed the data gathered will contribute to its 'richness'. Some skills are more critical to safety and operational requirements while the same skills may be more or less frequently practised. These points are raised for the assessors to consider when choosing an assessment method and developing assessment instruments. Sample assessment instruments are included for Assessors in the Assessment Guidelines of this Training Package.

Critical aspects of evidence required to demonstrate competency in this unit

9.2)

Before the critical aspects of evidence are considered all prerequisites shall be met.

Evidence for competence in this unit shall be considered holistically. Each element and associated performance criteria shall be demonstrated on at least two occasions in accordance with the 'Assessment Guidelines - UEE07'. Evidence shall also comprise:

- A representative body of work performance demonstrated within the timeframes typically expected of the discipline, work function and industrial environment. In particular this shall incorporate evidence that shows a candidate is able to:
    - Implement Occupational Health and Safety workplace procedures and practices including the use of risk control measures as specified in the performance criteria and range statement
    - Apply sustainable energy principles and practices as specified in the performance criteria and range statement
    - Demonstrate an understanding of the essential knowledge and associated skills as described in this unit . It may be required by some jurisdictions that RTOs provide a percentile graded result for the purpose of regulatory or licensing requirements.
    - Demonstrate an appropriate level of skills enabling employment
    - Conduct work observing the relevant Anti Discrimination legislation, regulations, polices and workplace procedures
- Demonstrated consistent performance across a representative range of contexts from the prescribed items below:

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EVIDENCE GUIDE

- Find and repair faults in electrical apparatus and circuits as described as described in 8) and including:

  A Envisaging the likely extent of the fault and the work from fault/breakdown reports and/or discussion to elicit information on the fault/breakdown with appropriate person(s).

  B Using appropriate tools and resources, and methodical fault finding techniques.

  C Locating and trouble-shooting faults efficiently.

  D Conducting tests or measurements in strict accordance with OHS and electrical safe working requirements.

  E Rectifying faults effectively.

  F Reporting cause of the fault and justifying the repairs undertaken.

  G Dealing with unplanned events

Context of and specific resources for assessment

9.3)

This unit should be assessed as it relates to normal work practice using procedures, information and resources typical of a workplace. This should include:

- OHS policy and work procedures and instructions.
- Suitable work environment, facilities, equipment and materials to undertake actual work as prescribed by this unit.

These should be part of the formal learning/assessment environment.

Note:

Where simulation is considered a suitable strategy for assessment, conditions must be authentic and as far as possible reproduce and replicate the workplace and be consistent with the approved industry simulation policy.

The resources used for assessment should reflect current industry practices in relation to trouble-shooting and repairing faults in electrical apparatus and circuits.

Method of assessment

9.4)

This unit shall be assessed by methods given in Volume 1, Part 3

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EVIDENCE GUIDE

'Assessment Guidelines'.

Note:
Competent performance with inherent safe working practices is expected in the industry to which this unit applies. This requires assessment in a structured environment which is primarily intended for learning/assessment and incorporates all necessary equipment and facilities for learners to develop and demonstrate the essential knowledge and skills described in this unit.

Concurrent assessment and relationship with other units

9.**5**)

For optimisation of training and assessment effort, competency development in this unit may be arranged concurrently with unit:

UEENEEG109A	Develop and connect electrical control circuits t

Range Statement

RANGE STATEMENT

8) This relates to the unit as a whole providing the range of contexts and conditions to which the performance criteria apply. It allows for different work environments and situations that will affect performance.

This unit shall be demonstrated in trouble-shooting and repairing faults in electrical apparatus and circuits designed for voltages up to 1000 V a.c. or 1500 V d.c in at least:

Four of the following **equipment and associated circuit**

- Switchboards
- Protective devices
- Lighting
- Heating
- Socket outlets
- Control devices

and

Three of the following **machines and associated control circuits**

- Single phase motors
- Single phase motor controls
- Three phase motors

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RANGE STATEMENT

- Three phase motor controls
- Synchronous machines
- DC machines
- DC machines controls
- Transformers and auxiliary components

Notes.

1. The different types of faults include; Open-circuit; Short-circuit; Incorrect connections; Insulation failure; Unsafe condition; Apparatus/component failure; Related mechanical failure; Other electrical apparatus and circuit faults

2. Examples of apparatus are Control devices; Fixed appliances/accessories; Lighting; Single phase motors and their controls; Socket outlets Three phase motors and their controls, synchronous machines and their controls, transformers and their controls, switchboards and/or distribution boards and their controls, protection and/or metering devices, a.c./d.c. machines and their controls other like equipment/accessories.

3. Examples of circuits include those supplying fixed appliances; lighting; single-phase motors; socket outlets; three phase motors and controls circuits; machines and transformers; electronic or computer based equipment other like equipment/accessories.

Generic terms used throughout this Vocational Standard shall be regarded as part of the Range Statement in which competency is demonstrated. The definition of these and other terms that apply are given in Volume 2, Part 2.1.

Unit Sector(s)

Not Applicable

Competency Field

2.2) Literacy and numeracy skills

Participants are best equipped to achieve competency in this unit if they have reading, writing and numeracy skills indicated by the following scales. Description of each scale is given in Volume 2, Part 3 'Literacy and Numeracy'

Reading	4	Writing	4	Numeracy	4

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Custom Content Section

Competency Field **5)**

Electrical

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UEENEEG109A Develop and connect electrical control circuits

Modification History

Not Applicable

Unit Descriptor

Unit Descriptor **1**)

1.1) Descriptor

This unit covers developing, connecting and functionally testing electrical power and control circuits that perform specific control functions. It encompasses working safely; developing schematic/ladder diagrams and converting them to wiring diagrams; selecting and connecting contactors and control devices to perform a specific function.

Application of the Unit

Not Applicable

Licensing/Regulatory Information

1.2) License to practice

During Training: Competency development activities are subject to regulations directly related to licensing, occupational health and safety and where applicable contracts of training such as apprenticeships.

In the workplace: The application of the skills and knowledge described in this unit require a license to practice in the workplace where work is carried out on electrical equipment or installations which are designed to operate at voltages greater than 50 V a.c. or 120 V d.c.

Other conditions may apply under State and Territory legislative and regulatory requirements.

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Pre-Requisites

Prerequisite Unit(s) **2)**

2.1) Competencies

Granting competency in this unit shall be made only after competency in the following unit(s) has/have been confirmed.

UEENEEE101A	Apply Occupational Health and Safety regulations, codes and practices in the workplace
UEENEEE102A	Fabricate, dismantle, assemble of electrotechnology components
UEENEEE104A	Solve problems in d.c circuits
UEENEEE105A	Fix and secure electrotechnology equipment
UEENEEE107A	Use drawings, diagrams, schedules, standards, codes and specifications
UEENEEG006A	Solve problems in single and three phase low voltage machines
UEENEEG063A	Arrange circuits, control and protection for general electrical installations
UEENEEG101A	Solve problems in electromagnetic devices and related circuits
UEENEEG102A	Solve problems in low voltage a.c. circuit
UEENEEG106A	Terminate cables, cords and accessories for low voltage circuits

Employability Skills Information

Employability Skills **3)**

This unit contains Employability Skills

The required outcomes described in this unit of

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competency contain applicable facets of Employability Skills. The Employability Skills Summary of the qualification in which this unit of competency is packaged will assist in identifying Employability Skill requirements.

Application of the Unit **4**)

4.1) **General Application**

This unit applies to all qualifications, competencies and/or Skill Sets which require an electrical license.

4.2) **Importation**

RTOs wishing to import this unit into any qualification under the flexibility provisions of NQC Training Package Policy

Elements and Performance Criteria Pre-Content

6) Elements describe the essential outcomes of a unit of competency

Elements and Performance Criteria

ELEMENT	PERFORMANCE CRITERIA
1 Develop and prepare to connect electrical control circuits.	1.1 OHS procedures for a given work area are identified, obtained and understood.
	1.2 Established OHS risk control measures and procedures in preparation for the work are followed.
	1.3 Safety hazards, which have not previously been identified, are noted and established risk control measures are implemented.
	1.4 Control scenarios are determined from discussions with appropriate person(s) and documented in accordance with established procedures.

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ELEMENT	PERFORMANCE CRITERIA	
	1.5	Agreement for the control scenarios is sought from appropriate person(s) and documented in accordance with established procedures.
	1.6	Schematic arrangement of control circuits that complies with agreed scenarios is documented in accordance with established procedures.
	1.7	Materials needed to connect control circuits are obtained in accordance with established procedures and checked against job requirements.
	1.8	Tools, equipment and testing devices needed to connect control circuits are obtained in accordance with established procedures and checked for correct operation and safety.
	1.9	Preparatory work is checked to ensure no damage has occurred and complies with requirements.
2 Connect and test electrical control circuits.	2.1	OHS risk control measures and procedures for carrying out the work are followed.
	2.2	The need to test or measure live is determined in strict accordance with OHS requirements and when necessary conducted within established safety procedures.
	2.3	Circuits/machines/plant are checked as being isolated where necessary in strict accordance OHS requirements and procedures.
	2.4	Control circuit components are connected to comply with the agreed control scenario.
	2.5	Control circuit operation is tested for agreed functionality and in strict accordance with OHS requirements and established safety procedures.
	2.6	Non-compliant control functions are rectified to comply with the agreed control scenario.
	2.7	Unexpected situations are dealt with safely and with the approval of an authorised person.

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ELEMENT	PERFORMANCE CRITERIA	
	2.8	Control circuits are connected and tested efficiently without unnecessary waste of materials or damage to apparatus, circuits, the surrounding environment or services and using sustainable energy practice.
3 Completion and document circuit development activities.	3.1	OHS work completion risk control measures and procedures are followed.
	3.2	Work site is cleaned and made safe in accordance with established procedures.
	3.3	'As-connected' control circuits are documented using standard drawing conventions and an appropriate person or persons notified in accordance with established procedures.

Required Skills and Knowledge

REQUIRED SKILLS AND KNOWLEDGE

7) This describes the essential skills and knowledge and their level, required for this unit.

Evidence shall show that knowledge has been acquired of safe working practices and developing and connecting control circuits.

All knowledge and skills detailed in this unit should be contextualised to current industry practices and technologies.

KS01-EG109A Electrical control devices and circuits

Evidence shall show an understanding of electrical control devices and circuits to an extent indicated by the following aspects:

T1 Basic relay circuits encompassing:

- Identification of given circuit diagrams (schematic) symbols and explain the operation of the components represented
- labelling wires and terminal (numbering systems)
- control relay - operating principles, basic contact configurations and identification and common applications
- push button - switching configurations and common applications
- selecting pushbuttons/pilot lamps from manufacturer’s catalogues for specific

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REQUIRED SKILLS AND KNOWLEDGE

applications

- development of simple stop-start relay circuit that incorporates pilot lights and latching circuit.
- connection and testing of control circuits

T2 Relay circuits and drawing conventions encompassing:

- circuit diagram drawing conventions
- selecting relays from manufacturers' catalogue for specified applications
- circuit development of electrical control circuit in accordance with a written description (specification) and list the sequence of operation of the circuit
- connecting simple electrical control circuit from circuit diagrams
- applying safe working practices when testing an electrical control circuit

T3 Remote STOP-START control and electrical interlocking encompassing:

- operation of local and remote start-stop control of relays
- operation of an electrically interlocked relay circuit
- development of a relay circuit incorporating local and remote start and stop buttons and electrical interlocking.
- connecting electrical circuits with local and remote start-stop control and with electrical interlocking.
- applying circuit checking and testing techniques to an electrical control circuit.

T4 Time delay relays encompassing:

- timers - operating principles, basic contact configurations and identification and common applications
- selecting timers for specified functions from manufactures' catalogues
- development of timer controlled circuits from a written description and list the sequence of circuit operation
- connecting a timer controlled circuit using a circuit diagram as a guide.
- timer circuit checking and testing procedures.

T5 Circuits using contactors encompassing:

- contactors - operating principles, basic contact configurations and identification and common applications
- thermal overloads - operating principles, basic contact configurations and identification and common applications
- circuit diagram symbols
- circuit development using a contactor
- using contactors for motor control.
- compliance requirements for devices for isolating circuits.

T6 Jogging and interlocking encompassing:

- purpose and application of jogging control of motors
- operation of motor control using start, stop and jog buttons

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REQUIRED SKILLS AND KNOWLEDGE

- purpose and application of electrical/mechanical interlocking
- developing a multiple motor starting circuit from a description of the circuit operation including jog and interlock functions.
- selecting circuit components using manufacturers' catalogues for appropriate duty ratings
- connecting and testing a multiple motor starting circuit which incorporates start, stop and jog control.

T7 Control devices encompassing:

- common control devices used in automatic control circuits: limit switches, proximity switches, photoelectric cells, pressure switches, float switches, light sensors and temperature sensors
- basic operating principles of common control devices
- advantages and disadvantages of common control devices
- applications for common control devices
- selecting control devices using manufacturers' catalogues for specified applications
- connection of control devices into control circuits

T8 Programmable relays encompassing:

- programmable relays - advantages over electromagnetic relay circuit control.
- typical applications of programmable relays.
- block diagram representation and basic operating principles
- input and output parameters, listing, connections and output types.
- connecting input and output devices to a programmable relay using a diagram
- basic programming of ladder circuits consisting of inputs, outputs i.e. stop-start circuit
- using the monitoring facility of the programmable relay to verify each ladder circuit operation.
- programming timers and using the monitoring facility of the programmable relay to check the values of the timer
- external devices
- implications of programming normally closed field devices
- conversion of control circuits
- installation of programmable control relays
- common faults and their symptoms

T9 Three-phase induction motor starters encompassing:

- reasons for limiting the starting current of large motors.
- requirements of the wiring rules (AS/NZS 3000) and the local supply authority service rules, with regard to starting and control of induction motors.
- DOL starter operating principles, applications and circuits
- electronic (soft) starter operating principles, applications and circuits
- connecting a DOL motor starter and testing the operation of the power and control circuits

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REQUIRED SKILLS AND KNOWLEDGE

- installation of DOL and soft starters

T10 Three-phase induction motor starters- reduced voltage encompassing:

- star-delta starter operating principles and circuits
- primary resistance starter operating principles and circuits
- auto-transformer starter operating principles and circuits
- secondary resistance starter operating principles and circuits
- common applications for each starter type
- comparison of motor starters basic characteristics
- selecting the most suitable motor starter for a given situation
- connecting motor starter power and control circuits for correct operation
- measuring starting current and torque of selected motor starters
- installation of reduced voltage starters

T11 Three-phase induction motor reversal and braking encompassing:

- reversing operating principles and control circuits
- plug braking operating principles and circuits
- dynamic braking operating principles and circuits
- regenerative braking operating principles and circuits
- eddy current brakes operating principles and circuits
- mechanical brakes operating principles and circuits
- comparison of the difference braking methods used.
- typical applications for each braking method.
- connecting a circuit with a braking feature to operate a three-phase motor.
- installation of motor braking control circuits

T12 Three-phase induction motor speed control encompassing:

- pole changing operating principles and circuits
- variable frequency drives operating principles and circuits
- slip-ring motors operating principles and circuits
- installation of motor speed controllers.

Evidence Guide

EVIDENCE GUIDE

9) The evidence guide provides advice on assessment and must be read in conjunction with the Performance Criteria, Required Skills and Knowledge, the Range Statement and the Assessment Guidelines for this Training Package.

The Evidence Guide forms an integral part of this unit. It must be used in conjunction with

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EVIDENCE GUIDE

all parts of this unit and performed in accordance with the Assessment Guidelines of this Training Package.

Overview of Assessment

9.1)

Longitudinal competency development approaches to assessment, such as Profiling, require data to be reliably gathered in a form that can be consistently interpreted over time. This approach is best utilised in Apprenticeship programs and reduces assessment intervention. It is the Industry's preferred model for apprenticeships. However, where summative (or final) assessment is used it is to include the application of the competency in the normal work environment or, at a minimum, the application of the competency in a realistically simulated work environment. It is recognised that, in some circumstances, assessment in part or full can occur outside the workplace. However, it must be in accordance with industry and regulatory policy.

Methods chosen for a particular assessment will be influenced by various factors. These include the extent of the assessment, the most effective locations for the assessment activities to take place, access to physical resources, additional safety measures that may be required and the critical nature of the competencies being assessed.

The critical safety nature of working with electricity, electrical equipment, gas or any other hazardous substance/material carries risk in deeming a person competent. Sources of evidence need to be 'rich' in nature to minimise error in judgment.

Activities associated with normal every day work have a bearing on the decision as to how much and how detailed the data gathered will contribute to its 'richness'. Some skills are more critical to safety and operational requirements while the same skills may be more or less frequently practised. These points are raised for the assessors to consider when choosing an assessment method and developing assessment instruments. Sample assessment instruments are included for Assessors in the Assessment Guidelines of this Training Package.

Critical aspects of evidence required to demonstrate competency in this unit

9.2)

Before the critical aspects of evidence are considered all prerequisites shall be met.

Evidence for competence in this unit shall be considered holistically. Each element and associated performance criteria shall be demonstrated on at least two occasions in accordance with the 'Assessment Guidelines - UEE07'. Evidence shall also comprise:

- A representative body of work performance demonstrated within the timeframes typically expected of the discipline, work function

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EVIDENCE GUIDE

and industrial environment. In particular this shall incorporate evidence that shows a candidate is able to:

- Implement Occupational Health and Safety workplace procedures and practices including the use of risk control measures as specified in the performance criteria and range statement
- Apply sustainable energy principles and practices as specified in the performance criteria and range statement
- Demonstrate an understanding of the essential knowledge and associated skills as described in this unit. It may be required by some jurisdictions that RTOs provide a percentile graded result for the purpose of regulatory or licensing requirements.
- Demonstrate an appropriate level of skills enabling employment
- Conduct work observing the relevant Anti Discrimination legislation, regulations, polices and workplace procedures

- Demonstrated consistent performance across a representative range of contexts from the prescribed items below:
  - Develop and connect control circuits as described as described in 8) and including:
    - A Determining control scenarios specifications.
    - B Developing schematic arrangement of control circuits that meets the required scenario as specified.
    - C Connecting control circuit to function as specified.
    - D Conducting safety and functional testing correctly
    - E Identifying and correcting non-compliant control functions.
    - F Documenting 'as-connected' control circuit.
    - G Dealing with unplanned events

Context of and specific resources for assessment

9.3)

This unit should be assessed as it relates to normal work practice using procedures, information and resources typical of a workplace. This should include:

- OHS policy and work procedures and instructions.
- Suitable work environment, facilities, equipment and materials to undertake actual work as prescribed by this unit.

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These should be part of the formal learning/assessment environment.

Note:

Where simulation is considered a suitable strategy for assessment, conditions must be authentic and as far as possible reproduce and replicate the workplace and be consistent with the approved industry simulation policy.

The resources used for assessment should reflect current industry practices in relation to development and connecting electrical control circuits.

Method of assessment

9.4)

This unit shall be assessed by methods given in Volume 1, Part 3 'Assessment Guidelines'.

Note:
Competent performance with inherent safe working practices is expected in the industry to which this unit applies. This requires assessment in a structured environment which is primarily intended for learning/assessment and incorporates all necessary equipment and facilities for learners to develop and demonstrate the essential knowledge and skills described in this unit.

Concurrent assessment and relationship with other units

9.5)

For optimisation of training and assessment effort, competency development in this unit may be arranged concurrently with unit:

UEENEEG108B	Trouble-shoot and repair faults in low voltage electrical apparatus and circuits

Range Statement

RANGE STATEMENT

8) This relates to the unit as a whole providing the range of contexts and conditions to which the performance criteria apply. It allows for different work environments and situations that will affect performance.

This unit shall be demonstrated in relation to developing, connecting and safety and functional testing on more than one occasion of at least four of the following control circuits:

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RANGE STATEMENT

- Multiple light switching circuit
- Master control circuit
- Single stop-start circuit
- Multiple stop-start circuit
- Time controlled circuit
- Machine interlocked circuit
- Motor jogging circuit
- Machine safety circuit

and,

using at least five of the following devices

- Multi-way switches
- Switches with more than two positions and Off
- Push buttons
- Electromechanical relays
- Programmable relays
- Contactors
- Reversing contactors
- Three phase starters
- Reduced voltage starters

and

with at least two of the following transducers/sensors:

- Timers
- Limit switches
- Proximity switches
- Photoelectric cells
- Pressure switches
- Float switches
- Light sensors
- Temperature sensors

Generic terms used throughout this Vocational Standard shall be regarded as part of the Range Statement in which competency is demonstrated. The definition of these and other terms that apply are given in Volume 2, Part 2.1.

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Unit Sector(s)

Not Applicable

Competency Field

2.2) Literacy and numeracy skills

Participants are best equipped to achieve competency in this unit if they have reading, writing and numeracy skills indicated by the following scales. Description of each scale is given in Volume 2, Part 3 'Literacy and Numeracy'

Reading	4	Writing	4	Numeracy	4

2.2) Literacy and numeracy skills

Competency Field **5)**

Electrical

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UEENEEG110A Find and repair faults in LV d.c. electrical apparatus and circuits

Modification History

Not applicable.

Unit Descriptor

Unit Descriptor **1) Scope:**

1.1) Descriptor

This unit covers finding and repairing faults in electrical apparatus and interconnecting circuits and equipment operating at voltages up to 1,500 V d.c. It encompasses working safely, reading circuit diagrams, sketching diagrams from traced wiring, applying logical fault finding procedures, conducting repairs and completing the necessary service documentation.

Application of the Unit

Application of the Unit **2)**

This unit is intended for competency development entry-level employment based programs incorporated in approved contracts of training. It may also used to augment formally acquired competencies.

Licensing/Regulatory Information

License to practice **3)**

The skills and knowledge described in this unit require a license to practice in the workplace subject to regulations for undertaking of electrical work. Practice in workplace and during training is also subject to regulations directly related to occupational health and safety and where applicable contracts of training such as apprenticeships.

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Pre-Requisites

Prerequisite Unit(s) **4)**

Competencies **4.1)**

Granting competency in this unit shall be made only after competency in the following unit(s) has/have been confirmed.

UEENEEE101A	Apply Occupational Health and Safety regulations, codes and practices in the workplace
UEENEEE102A	Fabricate, dismantle, assemble of utilities components
UEENEEE104A	Solve problems in d.c circuits
UEENEEE105A	Fix and secure electrotechnology equipment
UEENEEE107A	Use drawings, diagrams, schedules, standards, codes and specifications
UEENEEG006A	Solve problems in single and three phase low voltage machines
UEENEEG033A	Solve problems in single and three phase electrical apparatus and circuits
UEENEEG063A	Arrange circuits, control and protection for general electrical installations
UEENEEG101A	Solve problems in electromagnetic devices and related circuits
UEENEEG102A	Solve problems in low voltage a.c. circuit
UEENEEG106A	Terminate cables, cords and accessories for low voltage circuits
UEENEEG108A	Trouble-shoot and repair faults in low voltage electrical apparatus and circuits

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Literacy and numeracy skills **4.2)**

Participants are best equipped to achieve competency in this unit if they have reading, writing and numeracy skills indicated by the following scales. Description of each scale is given in Volume 2, Part 3 'Literacy and Numeracy'

Reading 4 Writing 4 Numeracy 4

Employability Skills Information

Employability Skills **5)**

This unit contains Employability Skills

The required outcomes described in this unit of competency contain applicable facets of Employability Skills. The Employability Skills Summary of the qualification in which this unit of competency is packaged will assist in identifying Employability Skill requirements.

Elements and Performance Criteria Pre-Content

6) Elements describe the essential outcomes of a competency standard unit

Performance Criteria describe the required performance needed to demonstrate achievement of the element. Assessment of performance is to be consistent with the Evidence Guide.

Elements and Performance Criteria

ELEMENT	PERFORMANCE CRITERIA
1 Prepare to find and rectify faults.	1.1 OHS procedures for a given work area are identified, obtained and understood.
	1.2 OHS risk control measures and procedures in preparation for the work are followed.

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ELEMENT	PERFORMANCE CRITERIA	
	1.3	The likely extent of work to be undertaken is envisaged from fault/breakdown reports and/or discussions with appropriate person(s).
	1.4	Advice is sought from the work supervisor to ensure the work is coordinated effectively with others.
	1.5	Sources of materials that may be required for the work are established in accordance with established procedures.
	1.6	Tools, equipment and testing devices needed to locate faults are obtained in accordance with established procedures and checked for correct operation and safety.
2 Find and repair faults.	2.1	OHS risk control measures and procedures for carrying out the work are followed.
	2.2	The need to test or measure live is determined in strict accordance with OHS requirements and when necessary conducted within established safety procedures.
	2.3	Circuits/machines/plant are checked as being isolated where necessary in strict accordance OHS requirements and procedures.
	2.4	Safety hazards resulting from the fault or breakdown are documented and risk control measures devised and implemented in consultation with appropriate personnel.
	2.5	Fault finding is approached methodically drawing on knowledge of d.c. circuit and apparatus using measured and calculated values of circuit/apparatus parameters.
	2.6	Circuit/apparatus components are dismantled where necessary and parts stored to protect them against loss or damage.
	2.7	Faulty circuits/components are rechecked and their fault status and acquired.
	2.8	Materials/replacement parts required to rectify

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ELEMENT	PERFORMANCE CRITERIA	
		faults are sourced and obtained in accordance with established procedures.
	2.9	Effectiveness of the repair is tested in accordance with established procedures.
	2.10	Apparatus is reassembled, finally tested and prepared for return to service.
	2.11	Unexpected situations are dealt with safely and with the approval of an authorised person.
	2.12	Fault finding and repair activities are carried out without damage to apparatus, circuits, the surrounding environment or services and using sustainable energy practices.
3 Completion and report fault finding and repair activities.	3.1	OHS work completion risk control measures and procedures are followed.
	3.2	Reusable, faulty or worn components are tagged and dispatched for repair to maintain adequate spares.
	3.3	Maintenance work activities are documented in accordance with established procedures. Note. Examples of documentation are component faults reports, test results, authorisations, permits, parts/component dispatch and stores records.

Required Skills and Knowledge

REQUIRED SKILLS AND KNOWLEDGE

8) This describes the essential skills and knowledge and their level, required for this unit.

Evidence shall show that knowledge has been acquired of safe working practices and finding and repairing faults in LV d.c. electrical apparatus and circuits.

All knowledge and skills detailed in this unit should be contextualised to current industry practices and technologies.

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REQUIRED SKILLS AND KNOWLEDGE

KS01-EG110A Direct current machines and controls

Evidence shall show an understanding of d.c. motor control methods to an extent indicated by the following aspects:

T1 Direct current machines encompassing:

- Purpose, types and applications
- Operating principles
- Installation and starting/running requirements and limitations
- Connection arrangements
- Typical fault symptoms and related conditions

T2 Direct current motor starters and their operating principles encompassing:

- back emf
- series-lockout
- timed starters
- electronic controllers

T3 Power and control connection arrangements encompassing:

- Built-in stop/start control
- Remote stop/start control
- Overload protection
- Interlocking with other starters and controls

T4 Braking methods encompassing:

- Dynamic,
- Plugging,
- Electromechanical, and
- Regenerative.

T5 Speed control methods encompassing:

- Field control
- Rheostatic control
- Voltage control

T6 Protection of d.c. motors

Evidence Guide

EVIDENCE GUIDE

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EVIDENCE GUIDE

9) The evidence guide provides advice on assessment and must be read in conjunction with the Performance Criteria, Required Skills and Knowledge, the Range Statement and the Assessment Guidelines for this Training Package.

The Evidence Guide forms an integral part of this unit. It must be used in conjunction with all parts of this unit and performed in accordance with the Assessment Guidelines of this Training Package.

Overview of Assessment **9.1)**

Longitudinal competency development approaches to assessment, such as Profiling, require data to be reliably gathered in a form that can be consistently interpreted over time. This approach is best utilised in Apprenticeship programs and reduces assessment intervention. It is the Industry's preferred model for apprenticeships. However, where summative (or final) assessment is used it is to include the application of the competency in the normal work environment or, at a minimum, the application of the competency in a realistically simulated work environment. It is recognised that, in some circumstances, assessment in part or full can occur outside the workplace. However, it must be in accordance with industry and regulatory policy.

Methods chosen for a particular assessment will be influenced by various factors. These include the extent of the assessment, the most effective locations for the assessment activities to take place, access to physical resources, additional safety measures that may be required and the critical nature of the competencies being assessed.

The critical safety nature of working with electricity, electrical equipment, gas or any other hazardous substance/material carries risk in deeming a person competent. Sources of evidence need to be 'rich' in nature to minimise error in judgment.

Activities associated with normal every day work have a bearing on the decision as to how much and how detailed the data gathered will contribute to its 'richness'. Some skills are more critical to safety and operational requirements while the same skills may be more or less frequently practised. These points are raised for the assessors to consider when choosing an assessment method and developing assessment instruments. Sample assessment instruments are included for Assessors in the Assessment Guidelines of this Training Package.

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Critical aspects of evidence required to demonstrate competency in this unit **9.2)**

Before the critical aspects of evidence are considered all prerequisites shall be met.

Evidence for competence in this unit shall be considered holistically. Each element and associated performance criteria shall be demonstrated on at least two occasions in accordance with the 'Assessment Guidelines – UEE11'. Evidence shall also comprise:

- A representative body of work performance demonstrated within the timeframes typically expected of the discipline, work function and industrial environment. In particular this shall incorporate evidence that shows a candidate is able to:
  - Implement Occupational Health and Safety workplace procedures and practices including the use of risk control measures as specified in the performance criteria and range statement
  - Apply sustainable energy principles and practices as specified in the performance criteria and range statement
  - Demonstrate an understanding of the essential knowledge and associated skills as described in this unit. It may be required by some jurisdictions that RTOs provide a percentile graded result for the purpose of regulatory or licensing requirements.
  - Demonstrate an appropriate level of skills enabling employment
  - Conduct work observing the relevant Anti Discrimination legislation, regulations, polices and workplace procedures
- Demonstrated consistent performance across a representative range of contexts from the prescribed items below:
  - Find and repair faults in d.c. electrical apparatus and circuits as described in 8) and including:

A Envisaging the likely extent of work from fault/breakdown reports and discussion with appropriate person(s).

B Using methodical fault finding techniques.

C Finding faults efficiently.

D Rectifying faults effectively.

E Completing documentation correctly.

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F Dealing with unplanned events by drawing on essential knowledge and skills to provide appropriate solutions incorporated in the holistic assessment with the above listed items.

Context of and specific resources for assessment

9.3)

This unit should be assessed as it relates to normal work practice using procedures, information and resources typical of a workplace. This should include:

OHS policy and work procedures and instructions.

Suitable work environment, facilities, equipment and materials to undertake actual work as prescribed by this unit.

These should be part of the formal learning/assessment environment.

Note:

Where simulation is considered a suitable strategy for assessment, conditions must be authentic and as far as possible reproduce and replicate the workplace and be consistent with the approved industry simulation policy.

The resources used for assessment should reflect current industry practices in relation to finding and repairing faults in d.c. electrical apparatus and circuits.

Method of assessment

9.4)

This unit shall be assessed by methods given in Volume 1, Part 3 ‘Assessment Guidelines’.

Note:

Competent performance with inherent safe working practices is expected in the industry to which this unit applies. This requires assessment in a structured environment which is primarily intended for learning/assessment and incorporates all necessary equipment and facilities for learners to develop and demonstrate the essential knowledge and skills described in this unit.

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Concurrent assessment and relationship with other units **9.5)**

For optimisation of training and assessment effort, competency development in this unit may be arranged concurrently with unit:

UEENEEG10 Develop and connect electrical control circuits 9A

Range Statement

RANGE STATEMENT

10) This relates to the unit as a whole providing the range of contexts and conditions to which the performance criteria apply. It allows for different work environments and situations that will affect performance.

This unit shall be demonstrated in relation to finding and repairing faults and their cause in d.c. electrical apparatus and circuits. Finding and repairing fault types in electrical apparatus and interconnecting circuits and equipment operating at voltages up to d.c include the following:

- Open-circuit
- Short-circuit
- Incorrect connections
- Insulation failure
- Unsafe condition
- Apparatus/component failure
- Related mechanical failure
- Other electrical apparatus and circuit faults
- Any five of the above shall apply.

Note:

1. Examples of apparatus are d.c switchboards/distribution boards, protective devices such as circuit breakers and fuses, and d.c machines and associated control devices.

2. Examples of circuits include those related to d.c. apparatus; d.c machines and controls circuits.

Generic terms used throughout this Vocational Standard shall be regarded as part of the Range Statement in which competency is demonstrated. The definition of these and other terms that apply are given in Volume 2, Part 2.1.

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Unit Sector(s)

Not applicable.

Competency Field

Competency Field **11)**

Electrical

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UEENEEG111A Carry out basic repairs to electrical components and equipment

Modification History

Not applicable.

Unit Descriptor

Unit Descriptor **1) Scope:**

1.1) Descriptor

This unit deals with the repair and/or replacement of mechanical and electrical components of electrical apparatus. It encompasses safe working practices, following written and oral instruction and procedures, basic testing and techniques for dismantling and assembling apparatus and disconnecting and reconnecting components

Application of the Unit

Application of the Unit **2)**

This unit may apply to persons entering work in electrotechnology and may be used in school based vocational programs.

Licensing/Regulatory Information

License to practice **3)**

The skills and knowledge described in this unit do not require a license to practice in the workplace provided equipment is not connected to installation wiring at voltage above 50 V a.c. or 120 V d.c. However, practice in this unit is subject to regulations directly related to occupational health and safety and where applicable contracts of training such as apprenticeships.

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License to practice **3)**

Note:

1. Compliance with permits may be required in various jurisdictions and typically relates to the operation of plant, machinery and equipment such as elevating work platforms, powder operated fixing tools, power operated tools, vehicles, road signage and traffic control and lifting equipment. Permits may also be required for some work environments such as confined spaces, working aloft, near live electrical apparatus and site rehabilitation.

2. Compliance may be required in various jurisdictions relating to currency in First Aid, confined space, lifting and risk safety measures.

Pre-Requisites

Prerequisite Unit(s) **4)**

Competencies **4.1)**

Granting competency in this unit shall be made only after competency in the following unit(s) has/have been confirmed.

UEENEEE101A	Apply Occupational Health and Safety regulations, codes and practices in the workplace
UEENEEE102A	Fabricate, assemble and dismantle utilities industry components

Literacy and numeracy skills **4.2)**

Participants are best equipped to achieve competency in this unit if they have reading, writing and numeracy skills indicated by the following scales. Description of each scale is given in Volume 2, Part 3 ‘Literacy and Numeracy’

Reading 3 Writing 3 Numeracy 3

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Employability Skills Information

Employability Skills **5)**

This unit contains Employability Skills

The required outcomes described in this unit of competency contain applicable facets of Employability Skills. The Employability Skills Summary of the qualification in which this unit of competency is packaged will assist in identifying Employability Skill requirements.

Elements and Performance Criteria Pre-Content

6) Elements describe the essential outcomes of a competency standard unit

Performance Criteria describe the required performance needed to demonstrate achievement of the element. Assessment of performance is to be consistent with the Evidence Guide.

Elements and Performance Criteria

ELEMENT	PERFORMANCE CRITERIA
1 Prepare to repair electrical apparatus.	1.1 OHS procedures for a given work area are obtained and understood through established routines and procedures.
	1.2 Established OHS risk control measures and procedures in preparation for the work are followed.
	1.3 The nature of the repair is obtained from documentation or from work supervisor to establish the scope of work to be undertaken.
	1.4 Advice is sought from the work supervisor to ensure the work is coordinated effectively with others.
	1.5 Sources of materials that may be required for the work are established in accordance with established routines and procedures.

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ELEMENT	PERFORMANCE CRITERIA	
	1.6	Tools, apparatus and testing devices needed to carry out the work are obtained and checked for correct operation and safety.
2 Repair electrical apparatus.	2.1	Established OHS risk control measures and procedures for carrying out the work are followed.
	2.2	The need to test or measure live is determined in strict accordance with OHS requirements and when necessary conducted within established safety procedures.
	2.3	Circuits/apparatus are checked as being isolated where necessary in strict accordance OHS requirements and procedures.
	2.4	Apparatus is dismantled in accordance with manufacturer's guide and supervisor's instructions.
	2.5	Component parts are tagged during the dismantling to help ensure correct and efficient reassembly and stored to protect them against loss or damage.
	2.6	Repairs are affected efficiently without damage to other components, apparatus or circuits.
	2.7	Apparatus is assembled in an appropriate sequence with all components parts placed, secured and connected in accordance with manufacturer's guide or industry practice.
	2.8	Procedures for referring non-routine events to immediate supervisor for directions are followed.
	2.9	Repairs are carried out efficiently without unnecessary waste of materials or damage to apparatus and the surrounding environment or services and using sustainable energy practices.
3 Complete and report repair work	3.1	OHS work completion risk control measures and procedures are followed.

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ELEMENT	PERFORMANCE CRITERIA
activities.	
	3.2 Repaired apparatus is prepared and forwarded to appropriate person(s) for testing.
	3.3 Work area is cleaned and made safe in accordance with established procedures.
	3.4 Work supervisor is notified of the completion of the repair work in accordance with established procedures.

Required Skills and Knowledge

REQUIRED SKILLS AND KNOWLEDGE

8) This describes the essential skills and knowledge and their level, required for this unit.

Evidence shall show that knowledge has been acquired of safe working practices and carrying out basic repairs to electrical apparatus.

All knowledge and skills detailed in this unit should be contextualised to current industry practices and technologies.

KS01-EG111A Electrical basic equipment repair

Evidence shall show an understanding of electrical workshop and metal cutting and an ability to carry out those activities to an extent indicated by the following aspects:

T1 Basic cable and conductor terminations encompassing:

- Insulation removal and replacement
- General aspects and soldering involving pins on electronic components and stranded conductors carrying current up to 25 amperes.
- Application of connecting devices for conductors and terminals
- Continuity through connections and insulation resistance testing
- Stress release on cables/conductors

T2 Electrical workshop machines encompassing:

- Fixed position power tools
- Tooling used on drilling machines
- Twist drills features, sharpening and faults
- Drilling operations

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REQUIRED SKILLS AND KNOWLEDGE

- Off hand grinding safety and machine set up

T3 Principles of metal cutting encompassing:

- Factors influencing the action of cutting tools
- Principles of chip formation
- Effects of cutting tool geometry
- Effects of coolants and cutting fluids

T4 Selection of cutting tools encompassing:

- Factors influencing tool selection
- Cutting tool materials
- Turning cutting tool design
- Milling cutting tool design
- Principles of chip control
- Identification and selection of carbides

T5 Metal cutting conditions encompassing:

- Conditions under which tools cut best
- Determining cutting data

T6 Cutting tool defects encompassing:

- Identification of types of tool failures
- Causes of tool failure

T7 Overcoming causes of tool failure

Evidence Guide

EVIDENCE GUIDE

9) The evidence guide provides advice on assessment and must be read in conjunction with the Performance Criteria, Required Skills and Knowledge, the Range Statement and the Assessment Guidelines for this Training Package.

The Evidence Guide forms an integral part of this unit. It must be used in conjunction with all parts of this unit and performed in accordance with the Assessment Guidelines of this Training Package.

Overview of 9.1)

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Assessment

Longitudinal competency development approaches to assessment, such as Profiling, require data to be reliably gathered in a form that can be consistently interpreted over time. This approach is best utilised in Apprenticeship programs and reduces assessment intervention. It is the Industry's preferred model for apprenticeships. However, where summative (or final) assessment is used it is to include the application of the competency in the normal work environment or, at a minimum, the application of the competency in a realistically simulated work environment. It is recognised that, in some circumstances, assessment in part or full can occur outside the workplace. However, it must be in accordance with industry and regulatory policy.

Methods chosen for a particular assessment will be influenced by various factors. These include the extent of the assessment, the most effective locations for the assessment activities to take place, access to physical resources, additional safety measures that may be required and the critical nature of the competencies being assessed.

The critical safety nature of working with electricity, electrical equipment, gas or any other hazardous substance/material carries risk in deeming a person competent. Sources of evidence need to be 'rich' in nature to minimise error in judgment.

Activities associated with normal every day work have a bearing on the decision as to how much and how detailed the data gathered will contribute to its 'richness'. Some skills are more critical to safety and operational requirements while the same skills may be more or less frequently practised. These points are raised for the assessors to consider when choosing an assessment method and developing assessment instruments. Sample assessment instruments are included for Assessors in the Assessment Guidelines of this Training Package.

Critical aspects of evidence required to demonstrate competency in this unit

9.2)

Before the critical aspects of evidence are considered all prerequisites shall be met.

Evidence for competence in this unit shall be considered holistically. Each element and associated performance criteria

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shall be demonstrated on at least two occasions in accordance with the 'Assessment Guidelines – UEE11'. Evidence shall also comprise:

- A representative body of work performance demonstrated within the timeframes typically expected of the discipline, work function and industrial environment. In particular this shall incorporate evidence that shows a candidate is able to:
  - Implement Occupational Health and Safety workplace procedures and practices including the use of risk control measures as specified in the performance criteria and range statement
  - Apply sustainable energy principles and practices as specified in the performance criteria and range statement
  - Demonstrate an understanding of the essential knowledge and associated skills as described in this unit. It may be required by some jurisdictions that RTOs provide a percentile graded result for the purpose of regulatory or licensing requirements.
  - Demonstrate an appropriate level of skills enabling employment
  - Conduct work observing the relevant Anti Discrimination legislation, regulations, polices and workplace procedures
- Demonstrated consistent performance across a representative range of contexts from the prescribed items below:
  - Carry out basic repairs to electrical apparatus as described as described in 8) and including:

A Following manufactures service instructions for access to components.

B Removing at least three different types of components specified in the work instructions.

C Replacing components to manufacturer's requirements.

D Terminating internal wiring correctly.

E Reassembling the apparatus correctly.

F Testing apparatus operation.

G Dealing with unplanned events by drawing on essential knowledge and skills to provide appropriate solutions incorporated in the holistic assessment with the above listed items.

Note:

Successful completion of relevant vendor training may be used to contribute to evidence on which competency is deemed. In these cases the alignment of outcomes of vendor training with performance criteria and critical aspects of evidence shall be

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clearly identified.

Context of and specific resources for assessment

9.3)

This unit should be assessed as it relates to normal work practice using procedures, information and resources typical of a workplace. This should include:

OHS policy and work procedures and instructions.

Suitable work environment, facilities, equipment and materials to undertake actual work as prescribed by this unit.

Resources required to assess this unit are listed above in Context of assessment', which should also be used in the formal learning/assessment environment.

Note:

Where simulation is considered a suitable strategy for assessment, conditions must be authentic and as far as possible reproduce and replicate the workplace and be consistent with the approved industry simulation policy.

The resources used for assessment should reflect current industry practices in relation to carrying out basic repairs to electrical apparatus.

Method of assessment

9.4)

This unit shall be assessed by methods given in Volume 1, Part 3 'Assessment Guidelines'.

Note:

Competent performance with inherent safe working practices is expected in the industry to which this unit applies. This requires assessment in a structured environment which is primarily intended for learning/assessment and incorporates all necessary equipment and facilities for learners to develop and demonstrate the essential knowledge and skills described in this unit.

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Concurrent assessment and relationship with other units **9.5)**

For optimisation of training and assessment effort, competency development in this unit may be arranged concurrently with unit:

UEENEEE102A	Fabricate, assemble and dismantle utilities industry components

The critical aspects of occupational health and safety covered in unit UEENEEE101A and other discipline specific occupational health and safety units shall be incorporated in relation to this unit.

Range Statement

RANGE STATEMENT

10) 8) This relates to the unit as a whole providing the range of contexts and conditions to which the performance criteria apply. It allows for different work environments and situations that will affect performance.

This unit shall be demonstrated in relation to carrying out basic repairs electrical apparatus limited to replacement or repair of components in which the fault has been previously established. This shall include at least two different electrical apparatus in which three different types of components are faulty one of which requires disconnecting and reconnecting internal wiring to affect repairs.

Generic terms used throughout this Vocational Standard shall be regarded as part of the Range Statement in which competency is demonstrated. The definition of these and other terms that apply are given in Volume 2, Part 2.1.

Unit Sector(s)

Not applicable.

Competency Field

Competency Field **11)**

Electrical

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UEENEEG116A Diagnose and rectify faults in traction lift systems

Modification History

Not applicable.

Unit Descriptor

Unit Descriptor **1) Scope:**

1.1) Descriptor

This unit covers diagnosing and rectifying faults in traction lift systems and equipment. It encompasses working safely, replacing and/or adjustment of lift circuit and associated components, diagnosing and repairing of faults in lift circuits and associated components (including governors, brakes, safety gear, safety devices, lift machines, door components and controllers) and releasing passengers from lifts which have become immobilised.

Application of the Unit

Application of the Unit **2)**

This unit applies to any formal recognition for this standard at the aligned AQF 3 level or higher.

Licensing/Regulatory Information

License to practice **3)**

The skills and knowledge described in this unit require a license to practice in the workplace where plant and equipment operate at voltage above 50 V a.c. or 120 V d.c. However other conditions may apply in some jurisdictions subject to regulations related to electrical work. Practice in the workplace and during training is also subject to regulations directly related to occupational health and safety and where applicable contracts of

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License to practice **3)**

training such as apprenticeships.

Pre-Requisites

Prerequisite Unit(s) **4)**

Competencies **4.1)**

Granting competency in this unit shall be made only after competency in the following unit(s) has/have been confirmed.

UEENEEE101A	Apply Occupational Health and Safety regulations, codes and practices in the workplace
UEENEEE102A	Fabricate, dismantle, assemble of utilities components
UEENEEE104A	Solve problems in d.c circuits
UEENEEE105A	Fix and secure electrotechnology equipment
UEENEEE107A	Use drawings, diagrams, schedules, standards, codes and specifications
UEENEEG006A	Solve problems in single and three phase low voltage machines
UEENEEG033A	Solve problems in single and three phase electrical apparatus and circuits
UEENEEG063A	Arrange circuits, control and protection for general electrical installations
UEENEEG101A	Solve problems in electromagnetic devices and related circuits
UEENEEG102A	Solve problems in low voltage a.c. circuit
UEENEEG106A	Terminate cables, cords and accessories for low voltage circuits

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Prerequisite Unit(s) **4)**

UEENEEG108A	Trouble-shoot and repair faults in low voltage electrical apparatus and circuits

Literacy and numeracy skills **4.2)**

Participants are best equipped to achieve competency in this unit if they have reading, writing and numeracy skills indicated by the following scales. Description of each scale is given in Volume 2, Part 3 'Literacy and Numeracy'

Reading	4	Writing	4	Numeracy	5

Employability Skills Information

Employability Skills **5)**

This unit contains Employability Skills

The required outcomes described in this unit of competency contain applicable facets of Employability Skills. The Employability Skills Summary of the qualification in which this unit of competency is packaged will assist in identifying Employability Skill requirements.

Elements and Performance Criteria Pre-Content

6) Elements describe the essential outcomes of a competency standard unit	Performance Criteria describe the required performance needed to demonstrate achievement of the element. Assessment of performance is to be consistent with the Evidence Guide.

Elements and Performance Criteria

ELEMENT	PERFORMANCE CRITERIA

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ELEMENT	PERFORMANCE CRITERIA	
1 Prepare to diagnose and rectify faults.	1.1	OHS procedures for a given work area are identified, obtained and understood.
	1.2	OHS risk control measures and procedures in preparation for the work are followed.
	1.3	The likely extend of work to be undertaken is envisaged from maintain procedures or fault/breakdown reports and/or discussions with appropriate person(s).
	1.4	Advice is sought from the work supervisor to ensure the work is coordinated effectively with others.
	1.5	Tools, equipment and testing devices needed to carry out the work are obtained in accordance with established procedures and checked for correct operation and safety.
2 Diagnose and rectify faults.	2.1	OHS risk control measures and procedures for carrying out the work are followed.
	2.2	The need to test or measure live is determined in strict accordance with OHS requirements and when necessary conducted within established safety procedures.
	2.3	Circuits/machines/plant are checked as being isolated where necessary in strict accordance OHS requirements and procedures.
	2.4	Safety hazards resulting from the fault or breakdown are documented and risk control measured and devised and implemented in consultation with appropriate personnel.
	2.5	Logical diagnostic methods are applied to diagnose lift system apparatus faults employing measurements and estimations of system operating parameters referenced to system operational requirements.
	2.6	Suspected fault scenarios are tested as being the cause(s) of system fault.
	2.7	Cause of the fault is identified and appropriately

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ELEMENT		PERFORMANCE CRITERIA	
			competent persons are engaged to rectify the fault where it is outside the scope of the lift systems.
		2.8	Faults in the lift components of the system are rectified to raise apparatus and system to its operational standard.
		2.9	System is tested to verify that the system operates as intended and to specified requirements
		2.10	Methods for dealing with unexpected situations are selected on the basis of safety and specified work outcomes.
		2.11	Diagnosis and rectification activities are carried out efficiently without unnecessary waste of materials or damage to apparatus and the surrounding environment or services and using sustainable energy practices.
3	Completion and report fault diagnosis and rectification activities	3.1	OHS work completion risk control measures and procedures are followed.
		3.2	Reusable, faulty or worn components are tagged and dispatched for repair to maintain adequate spares.
		3.3	Rectification of faults is documented in accordance with established procedures. Note. Examples of documentation are components fault reports, test results, authorisations, permits, parts/component dispatch and store records
		3.4	Appropriate person or persons notified, in accordance with established procedures, that the system faults have been rectified.

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Required Skills and Knowledge

REQUIRED SKILLS AND KNOWLEDGE

8) This describes the essential skills and knowledge and their level, required for this unit.

Evidence shall show that knowledge has been acquired of safe working practices and diagnosing and rectifying faults in lifts systems.

All knowledge and skills detailed in this unit should be contextualised to current industry practices and technologies.

KS01-EG116A Traction lift systems

Evidence shall show an understanding of the operation of the various types of lifts and the emergency procedures for the release of trapped passengers to an extent indicated by the following aspects:

T1 Technical standards, regulations and codes for lifts and escalators encompassing:

- Lift Code
- Australian Standards relevant to lift systems

T2 Lift systems – drive types, construction and operation of passenger, goods and service lifts encompassing:

- Drive types
- Drive constructions
- Drive operations
- Single and team manual handling
- Communication on site
- Emergency procedures
- Passenger
- Goods
- Service

T3 Lift machine room encompassing:

- access
- Machine
- Controller
- Governor
- Floor selector

T4 Lift well equipment encompassing:

- Guide rails
- Landing doors and locks
- Limit switches/operating devices
- Ropes

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REQUIRED SKILLS AND KNOWLEDGE

- Roping systems
- Counterweights

T5 Lift pit encompassing:

- access
- Buffers
- Compensators
- Safety equipment

T6 Lift car encompassing:

- access
- Frame
- Superstructure
- Door operator
- Travelling cable
- Buttons and indicators
- Communication devices
- Safety gear

T7 Lift control circuits using relay logic encompassing:

- Button circuit
- Indicator/lantern circuit
- Key switch circuits
- Fans
- Mains supply
- Power circuits
- Floor selector circuitry
- Motor room control (selector)
- Well control (transducer)
- Directional circuitry
- Slowing and stopping circuitry
- Re-levelling circuitry
- Door operator circuitry
- Acceleration circuits

T8 Lift safety circuits encompassing:

- Landing door locks
- Car door locks
- Emergency stop
- Pit switch
- Car trap-door limit switch
- Fire service

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REQUIRED SKILLS AND KNOWLEDGE

- Car top switch
- Tappet switch
- Governor/switch
- Safety gear switch
- Reverse phase relay
- Phase failure relay
- Overloads
- Circuit breakers
- Limit switches
- Terminal stopping
- Door protection
- Circuit switches

T9 Lift components - electro-mechanical employing relay logic encompassing:

- Button circuit
- Indicator/lantern circuit
- Key switch circuits
- Fans
- Mains supply
- Power circuits
- Floor selector circuitry
- Motor room control (selector)
- Well control (transducer)
- Directional circuitry
- Slowing and stopping circuitry
- Re-levelling circuitry
- Door operator circuitry
- Acceleration circuits

T10 Lift components - electro-mechanical safety circuits encompassing:

- Landing door locks
- Car door locks
- Emergency stop
- Pit switch
- Car trap-door limit switch
- Fire service
- Car top switch
- Tappet switch
- Safety gear switch
- Terminal stopping
- Circuit switches are all highlighted

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REQUIRED SKILLS AND KNOWLEDGE

T11 Lift components - electronic encompassing:

- Encoders
- Transducers
- Electronic boards
- Selectors
- Rectifiers
- Capacitors
- Resistors
- Processor board
- I/O board

T12 Lift components – electrical encompassing:

- Relays; reverse phase and phase failure
- Tachos
- Limit switches
- Brushes
- Selectors
- Motor/generator
- Transformers
- Fuses
- Lamps
- Terminals

T13 Lift electrical layout and special requirements encompassing:

- Lift Code and AS 3000 requirements
- Special lift symbols
- Conduits
- Travelling cable
- Troughing
- Colour coding and labelling
- Segregation LV/ELV
- Communication cabling

T14 Traction encompassing:

- Speed/load characteristics
- Efficiency
- Application
- Brakes
- Electric prime mover (motor types and control)

T15 Geared types including rack and pinion and chain encompassing:

- Speed/load characteristics

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REQUIRED SKILLS AND KNOWLEDGE

- Efficiency
- Application
- Brakes
- Electric prime mover (motor types and control)
- Drum

T16 Electric lifts – mechanics encompassing:

- Governors Governor types including; vertical shaft, overspeed devices, horizontal shaft
- Governor operation testing and rope tension testing
- Safety gear Types; A instantaneous, B flexible guide clamp, C wedge clamp and D oil buffer
- Release procedures for each type of safety gear/governor combination
- Statutory requirements

T17 Maintenance, replacement and adjustment of mechanical lift components encompassing:

- Air cords
- Selectors
- Bearings; roller, sleeve, guide shoes, and slipper
- Door guides
- Landing doors
- Car doors
- Tapes/chains

T18 Brake types, function, operation, inspection and adjustment, circuitry, manual release and statutory requirements encompassing:

- Geared machine brakes
- Gearless machine brakes
- Brake function and statutory requirements
- Internal and external mechanical brakes
- Electrical operations including; stall motor, solenoid and hydraulic
- inspection and adjustment of mechanical and electrical brakes
- Brake circuitry
- Manual release devices and safe procedures
- Statutory requirements

T19 Electro-hydraulic lifts circuitry, controls and components encompassing:

- Electrical circuitry
- Pump motor, starter
- Governor switch
- Over travel limits
- Up, down solenoids

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REQUIRED SKILLS AND KNOWLEDGE

- Up, down limit switches
- Levelling switch
- Stop button
- Faulty components diagnosis
- Hydraulic components
- Hydraulic circuitry
- Servicing

T20 Electro-hydraulic lifts - mechanical operation – fluid power principles and components, operation, arrangements, lift code and other requirements and emergency passenger release encompassing:

- Fluids
- Hydraulics
- Pascal's Law
- Safety considerations of fluids under pressure
- Pump
- Control of hydraulic pressure
- Solenoid values
- Directional flow including pressure gauge
- Ram/cylinders, including single and multi stage
- Oil cooler
- Oil reservoir
- Filters
- Seals
- Bleeding lines
- General operation
- Types of arrangements including; side acting, direct and suspended
- Requirements of Lift Code/Standards including; viewing communication windows, labelling circuit breakers, head room/top of car, pump installation under car, anti-creep devices and closing of landing doors

T21 Emergency release procedures - trapped passengers – OHS considerations and communication with passengers encompassing:

- Enterprise requirements and procedures
- Passenger safety
- Moving under power
- Hand winding
- Determining numbers and condition of passengers
- Direction of lift travel before stopping
- Fault indication
- Status of doors
- Warnings about using controls

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REQUIRED SKILLS AND KNOWLEDGE

- Warnings about standing near doors
- Information related to impending movement
- Information relating to opening of doors
- Reassurance as to safety of passengers
- Emergency medical support

T22 Escalators and moving walks components encompassing:

- Machine Brakes
- Controller
- Safety devices
- Balustrade lighting
- Steps/pallets/belts
- Hand rail
- Drive chain
- Truss
- Track systems
- Step/pallet chains
- Rollers, Tension carriage
- Hand rail earthing

Evidence Guide

EVIDENCE GUIDE

9) The evidence guide provides advice on assessment and must be read in conjunction with the Performance Criteria, Required Skills and Knowledge, the Range Statement and the Assessment Guidelines for this Training Package.

The Evidence Guide forms an integral part of this unit. It must be used in conjunction with all parts of this unit and performed in accordance with the Assessment Guidelines of this Training Package.

Overview of Assessment	**9.1)**
	Longitudinal competency development approaches to assessment, such as Profiling, require data to be reliably gathered in a form that can be consistently interpreted over time. This approach is best utilised in Apprenticeship programs and reduces assessment intervention. It is the Industry's preferred model for apprenticeships. However, where summative (or final) assessment

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is used it is to include the application of the competency in the normal work environment or, at a minimum, the application of the competency in a realistically simulated work environment. It is recognised that, in some circumstances, assessment in part or full can occur outside the workplace. However, it must be in accordance with industry and regulatory policy.

Methods chosen for a particular assessment will be influenced by various factors. These include the extent of the assessment, the most effective locations for the assessment activities to take place, access to physical resources, additional safety measures that may be required and the critical nature of the competencies being assessed.

The critical safety nature of working with electricity, electrical equipment, gas or any other hazardous substance/material carries risk in deeming a person competent. Sources of evidence need to be 'rich' in nature to minimise error in judgment.

Activities associated with normal every day work have a bearing on the decision as to how much and how detailed the data gathered will contribute to its 'richness'. Some skills are more critical to safety and operational requirements while the same skills may be more or less frequently practised. These points are raised for the assessors to consider when choosing an assessment method and developing assessment instruments. Sample assessment instruments are included for Assessors in the Assessment Guidelines of this Training Package.

Critical aspects of evidence required to demonstrate competency in this unit

9.2)

Before the critical aspects of evidence are considered all prerequisites shall be met.

Evidence for competence in this unit shall be considered holistically. Each element and associated performance criteria shall be demonstrated on at least two occasions in accordance with the 'Assessment Guidelines – UEE11'. Evidence shall also comprise:

- A representative body of work performance demonstrated within the timeframes typically expected of the discipline, work function and industrial environment. In particular this shall incorporate evidence that shows a candidate is able to:

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- Implement Occupational Health and Safety workplace procedures and practices including the use of risk control measures as specified in the performance criteria and range statement
- Apply sustainable energy principles and practices as specified in the performance criteria and range statement
- Demonstrate an understanding of the essential knowledge and associated skills as described in this unit. It may be required by some jurisdictions that RTOs provide a percentile graded result for the purpose of regulatory or licensing requirements.
- Demonstrate an appropriate level of skills enabling employment
- Conduct work observing the relevant Anti Discrimination legislation, regulations, polices and workplace procedures

- Demonstrated consistent performance across a representative range of contexts from the prescribed items below:
  - Diagnose and rectify faults in lift systems as described as described in 8) and including:

A Governors.

B Brakes.

C Safety gear.

D Safety devices.

E Lift machines.

F Door components.

  - Replace and/or adjustment of lift equipment in at least three types of lift equipment as described below

A Electro-hydraulic lift.

B Electric traction lift.

C Passenger lift.

D Goods lift.

E Dealing with unplanned events by drawing on essential knowledge and skills to provide appropriate solutions incorporated in the holistic assessment with the above listed items.

Note:

Successful completion of relevant vendor training may be used to contribute to evidence on which competency is deemed. In these cases the alignment of outcomes of vendor training with performance criteria and critical aspects of evidence shall be clearly identified.

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Context of and specific resources for assessment

9.3)

This unit should be assessed as it relates to normal work practice using procedures, information and resources typical of a workplace. This should include:

OHS policy and work procedures and instructions.

Suitable work environment, facilities, equipment and materials to undertake actual work as prescribed by this unit.

These should be part of the formal learning/assessment environment.

Note:

Where simulation is considered a suitable strategy for assessment, conditions must be authentic and as far as possible reproduce and replicate the workplace and be consistent with the approved industry simulation policy.

The resources used for assessment should reflect current industry practices in relation to diagnosing and rectifying faults in lifts systems.

Method of assessment

9.4)

This unit shall be assessed by methods given in Volume 1, Part 3 ‘Assessment Guidelines’.

Note:

Competent performance with inherent safe working practices is expected in the industry to which this unit applies. This requires assessment in a structured environment which is primarily intended for learning/assessment and incorporates all necessary equipment and facilities for learners to develop and demonstrate the essential knowledge and skills described in this unit.

Concurrent assessment and relationship with other units

9.5)

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For optimisation of training and assessment effort, competency development in this unit may be arranged concurrently with unit:

UEENEEG108A	Trouble-shoot and repair faults in low voltage electrical apparatus and circuits

Range Statement

RANGE STATEMENT

10) This relates to the unit as a whole providing the range of contexts and conditions to which the performance criteria apply. It allows for different work environments and situations that will affect performance.

Competency shall be demonstrated in relation to diagnosing and rectifying faults in lift circuits and associated components for at least three (3) types of lift circuits/components as listed:

- Governors
- Brakes
- Safety gear
- Safety devices
- Lift machines
- Door components
- Controllers
- Release passengers from a lift, which has become immobilised

Generic terms used throughout this Vocational Standard shall be regarded as part of the Range Statement in which competency is demonstrated. The definition of these and other terms that apply are given in Volume 2, Part 2.1.

Unit Sector(s)

Not applicable.

Competency Field

Competency Field **11)**

Electrical

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UEENEEG129A Overhaul and repair major switchgear and controlgear

Modification History

Not applicable.

Unit Descriptor

Unit Descriptor **1) Scope:**

1.1) Descriptor

This unit covers the overhauling and repairing switchgear/controlgear rated in excess of 20 kA. It requires the ability to establish and document the level of work required, arranging for the overhaul/repair to be carried out, verify compliance of overhauled/repaired switchgear/controlgear and complete the necessary documentation.

Application of the Unit

Application of the Unit **2)**

This unit is intended to augment previously acquired competencies. It is suitable for employment-based programs under an approved contract of training.

Licensing/Regulatory Information

License to practice **3)**

The skills and knowledge described in this unit require a license to practice in the workplace where plant and switchgear/control gear operate at voltage above 50 V a.c. or 120 V d.c. Other conditions related to communications, electrical work, fire protection, gas work, high voltage work, refrigeration/air conditioning and security may apply in some jurisdictions subject to regulations. Practice in the workplace and during training is also subject to

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License to practice **3)**

regulations directly related to occupational health and safety and where applicable contracts of training such as apprenticeships.

Pre-Requisites

Prerequisite Unit(s) **4)**

Competencies **4.1)**

Granting competency in this unit shall be made only after competency in the following unit(s) has/have been confirmed.

UEENEEE101A	Apply Occupational Health and Safety regulations, codes and practices in the workplace
UEENEEE102A	Fabricate, dismantle, assemble of utilities components
UEENEEE104A	Solve problems in d.c circuits
UEENEEE105A	Fix and secure electrotechnology equipment
UEENEEE107A	Use drawings, diagrams, schedules, standards, codes and specifications
UEENEEG111A	Carry out basic repairs to electrical components and equipment
UEENEEG164A	Repair and maintain mechanical components of electrical machines

Literacy and numeracy skills **4.2)**

Participants are best equipped to achieve competency in this unit if they have reading, writing and numeracy skills indicated by the following scales. Description of each scale is given in Volume 2, Part 3 ‘Literacy and

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Numeracy'

Reading 4 Writing 4 Numeracy 4

Employability Skills Information

Employability Skills **5)**

This unit contains Employability Skills

The required outcomes described in this unit of competency contain applicable facets of Employability Skills. The Employability Skills Summary of the qualification in which this unit of competency is packaged will assist in identifying Employability Skill requirements.

Elements and Performance Criteria Pre-Content

6) Elements describe the essential outcomes of a competency standard unit

Performance Criteria describe the required performance needed to demonstrate achievement of the element. Assessment of performance is to be consistent with the Evidence Guide.

Elements and Performance Criteria

ELEMENT	PERFORMANCE CRITERIA
1 Prepare for overhaul/repair of switchgear/control gear.	1.1 OHS processes and procedures for a given work area are identified, obtained and understood.
	1.2 Established OHS risk control measures and procedures in preparation for the work are followed.
	1.3 Safety hazards that have not previously been identified are noted and established risk control measures are implemented.
	1.4 Instructions on the extent of overhaul and/or repair are received and expected outcomes of the work acquired with appropriate personnel.

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ELEMENT	PERFORMANCE CRITERIA	
	1.5	Appropriate personnel are consulted to ensure the work is coordinated effectively with others involved on the work site.
	1.6	Switchgear/control gear service and repair documentation is read and understood.
	1.7	Sources of materials that may be required for the work are established in accordance with established procedures.
	1.8	Tools, equipment and testing devices needed to work are obtained in accordance with established procedures and checked for correct operation and safety.
2 Overhaul switchgear/control gear.	2.1	OHS risk control measures and procedures for carrying out the work are followed.
	2.2	The need to test or measure live is determined in strict accordance with OHS requirements and when necessary conducted within established safety procedures.
	2.3	Circuits/machines/plant are checked as being isolated where necessary in strict accordance OHS requirements and procedures.
	2.4	Switchgear and control gear is dismantled and parts tagged and stored to prevent loss or damage.
	2.5	The state of switchgear/control gear components is determined by measurements, tests and inspections and results recorded.
	2.6	Materials/replacement parts required to complete the work are sourced and obtained in accordance with established procedures.
	2.7	Effectiveness of the repairs is tested in accordance with established procedures.
	2.8	Specifications and instructions for the overhaul/repair work are documented in accordance with requirements.

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ELEMENT	PERFORMANCE CRITERIA	
3 Document overhaul/repair work.	3.1	OHS work completion risk control measures and procedures are followed.
	3.2	Reusable, faulty or worn components are tagged and dispatched for repair to maintain adequate spares.
	3.3	Overhaul/repair work is documented in accordance with requirements stating that the switchgear/control gear complies with the overhaul specifications.

Required Skills and Knowledge

REQUIRED SKILLS AND KNOWLEDGE

8) This describes the essential skills and knowledge and their level, required for this unit.

Evidence shall show that knowledge has been acquired of safe working practices and overhauling and repairing major switchgear/controlgear.

All knowledge and skills detailed in this unit should be contextualised to current industry practices and technologies.

KS01-EG129A Switchgear and controlgear – 20 kA

Evidence shall show an understanding of the switchgear and controlgear to an extent indicated by the following aspects:

T1 Types and applications of switchgear and controlgear

T2 Operating principles of switchgear and controlgear

T3 Interlocking systems encompassing:

- external interlocking systems such as Castell Key systems
- internal interlocking systems for either safety or that operate in conjunction with say Castell Key systems

T4 Control and protection of switchgear and controlgear

T5 Installation requirements encompassing:

- operating specifications for equipment
- areas requiring repairs and maintenance
- determining if repairs/maintenance are to be carried in situ or in workshop environment
- relevant legislation and Standards applicable to the installation

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REQUIRED SKILLS AND KNOWLEDGE

- OHS issues with regard to removing/ re-installing heavy equipment
- electrical safety issues with regard to removing/ re-installing equipment
- understanding of CFC units

T6 Electrical switchgear and controlgear protection methods encompassing:

- understanding of the operation of switchgear when it opens under load
- understanding on the settings and operation required for both magnetic short-circuit and thermal overload with equipment
- determining the earth fault loop impedance requirements required to keep touch voltage values within requirements
- thermal imaging techniques
- time/current curves from manufacturers specifications
- equipment to safely test switchgear after repairs or maintenance
- effectiveness of arc suppression installed within the equipment
- modern types of switchgear that are computer controlled and programmed
- modern types of switchgear that are interconnected to other protective devices
- certification process for any repair or maintenance work performed
- phase-failure systems
- Verifying the correct fault-level for the installation is consistent with the kA rating of the equipment
- x-ray and ultrasonic detection systems with regard to metallurgy
- different types of lubricants required for different locations, temperatures and humidity

T7 Electrical safe working practices of working safely on or around electrical equipment encompassing:

- determining safe working Standards and codes of practice for equipment and installations over 20 kA
- OHS requirements for equipment and installations over 20 kA
- working knowledge of operating within the vicinity of live conductors, such as barriers
- procedures for working on switchgear over 20 kA
- risks and control measures associated with harmful dusts and airborne contaminants - sources include thermal insulation, fibrous cement materials and asbestos and other fibre reinforced switchboard materials
- checks and storage methods for maintaining the safety of testing devices

Evidence Guide

EVIDENCE GUIDE

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EVIDENCE GUIDE

9) The evidence guide provides advice on assessment and must be read in conjunction with the Performance Criteria, Required Skills and Knowledge, the Range Statement and the Assessment Guidelines for this Training Package.

The Evidence Guide forms an integral part of this unit. It must be used in conjunction with all parts of this unit and performed in accordance with the Assessment Guidelines of this Training Package.

Overview of Assessment **9.1)**

Longitudinal competency development approaches to assessment, such as Profiling, require data to be reliably gathered in a form that can be consistently interpreted over time. This approach is best utilised in Apprenticeship programs and reduces assessment intervention. It is the Industry's preferred model for apprenticeships. However, where summative (or final) assessment is used it is to include the application of the competency in the normal work environment or, at a minimum, the application of the competency in a realistically simulated work environment. It is recognised that, in some circumstances, assessment in part or full can occur outside the workplace. However, it must be in accordance with industry and regulatory policy.

Methods chosen for a particular assessment will be influenced by various factors. These include the extent of the assessment, the most effective locations for the assessment activities to take place, access to physical resources, additional safety measures that may be required and the critical nature of the competencies being assessed.

The critical safety nature of working with electricity, electrical equipment, gas or any other hazardous substance/material carries risk in deeming a person competent. Sources of evidence need to be 'rich' in nature to minimise error in judgment.

Activities associated with normal every day work have a bearing on the decision as to how much and how detailed the data gathered will contribute to its 'richness'. Some skills are more critical to safety and operational requirements while the same skills may be more or less frequently practised. These points are raised for the assessors to consider when choosing an assessment method and developing assessment instruments. Sample assessment instruments are included for Assessors in the Assessment Guidelines of this Training Package.

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Critical aspects of evidence required to demonstrate competency in this unit

9.2)

Before the critical aspects of evidence are considered all prerequisites shall be met.

Evidence for competence in this unit shall be considered holistically. Each element and associated performance criteria shall be demonstrated on at least two occasions in accordance with the 'Assessment Guidelines – UEE11'. Evidence shall also comprise:

- A representative body of work performance demonstrated within the timeframes typically expected of the discipline, work function and industrial environment. In particular this shall incorporate evidence that shows a candidate is able to:
  - Implement Occupational Health and Safety workplace procedures and practices including the use of risk control measures as specified in the performance criteria and range statement
  - Apply sustainable energy principles and practices as specified in the performance criteria and range statement
  - Demonstrate an understanding of the essential knowledge and associated skills as described in this unit. It may be required by some jurisdictions that RTOs provide a percentile graded result for the purpose of regulatory or licensing requirements.
  - Demonstrate an appropriate level of skills enabling employment
  - Conduct work observing the relevant Anti Discrimination legislation, regulations, polices and workplace procedures
- Demonstrated consistent performance across a representative range of contexts from the prescribed items below:
  - Overhaul and repair major switchgear/controlgear as described in 8) and including:

A Interpreting service and repair documentation correctly.

B Determining the state of switchgear/control gear correctly.

C Repairing switchgear/control gear effectively.

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D	Completing documentation correctly.
E	Dealing with unplanned events by drawing on essential knowledge and skills to provide appropriate solutions incorporated in the holistic assessment with the above listed items.

Note:

Successful completion of relevant vendor training may be used to contribute to evidence on which competency is deemed. In these cases the alignment of outcomes of vendor training with performance criteria and critical aspects of evidence shall be clearly identified.

Context of and specific resources for assessment

9.3)

This unit should be assessed as it relates to normal work practice using procedures, information and resources typical of a workplace. This should include:

OHS policy and work procedures and instructions.

Suitable work environment, facilities, equipment and materials to undertake actual work as prescribed by this unit.

These should be part of the formal learning/assessment environment.

Note:

Where simulation is considered a suitable strategy for assessment, conditions must be authentic and as far as possible reproduce and replicate the workplace and be consistent with the approved industry simulation policy.

The resources used for assessment should reflect current industry practices in relation to overhauling and repairing major switchgear/controlgear.

Method of assessment

9.4)

This unit shall be assessed by methods given in Volume 1, Part 3 ‘Assessment Guidelines’.

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Note:

Competent performance with inherent safe working practices is expected in the industry to which this unit applies. This requires assessment in a structured environment which is primarily intended for learning/assessment and incorporates all necessary equipment and facilities for learners to develop and demonstrate the essential knowledge and skills described in this unit.

Concurrent assessment and relationship with other units

9.5)

For optimisation of training and assessment effort, competency development in this unit may be arranged concurrently with unit:

UEENEEC001B	Maintain documentation
UEENEEC002B	Source and purchase material/parts for installation or service jobs

Range Statement

RANGE STATEMENT

10) This relates to the unit as a whole providing the range of contexts and conditions to which the performance criteria apply. It allows for different work environments and situations that will affect performance.

This unit shall be demonstrated in relation to overhauling at least two types of low voltage switchgear/control gear rated above 20 kA and any high voltage switchgear/control gear.

Generic terms used throughout this Vocational Standard shall be regarded as part of the Range Statement in which competency is demonstrated. The definition of these and other terms that apply are given in Volume 2, Part 2.1.

Unit Sector(s)

Not applicable.

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Competency Field

Competency Field **11)**

Electrical

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UEENEEG150A Wind electrical coils

Modification History

Not applicable.

Unit Descriptor

Unit Descriptor **1) Scope:**

1.1) Descriptor

This unit covers setting up coil former and winding machines and winding coils for static and rotating electrical machines. It encompasses working safely, using hand and powered tools, measuring, applying basic knowledge of electrical circuits, following technical instructions and set procedures and recording work activities.

Application of the Unit

Application of the Unit **2)**

This unit is intended for competency development entry-level employment based programs incorporated in approved contracts of training.

Licensing/Regulatory Information

License to practice **3)**

The skills and knowledge described in this unit do not require a license to practice in the workplace. However, practice in this unit is subject to regulations directly related to occupational health and safety and where applicable contracts of training such as apprenticeships.

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Pre-Requisites

Prerequisite Unit(s) **4)**

Competencies **4.1)**

Granting competency in this unit shall be made only after competency in the following unit(s) has/have been confirmed.

UEENEEE101A	Apply Occupational Health and Safety regulations, codes and practices in the workplace
UEENEEE102A	Fabricate, assemble and dismantle utilities industry components
UEENEEE107A	Use drawings, diagrams, schedules, standards, codes and specifications

Literacy and numeracy skills **4.2)**

Participants are best equipped to achieve competency in this unit if they have reading, writing and numeracy skills indicated by the following scales. Description of each scale is given in Volume 2, Part 3 ‘Literacy and Numeracy’

Reading 3 Writing 3 Numeracy 3

Employability Skills Information

Employability Skills **5)**

This unit contains Employability Skills

The required outcomes described in this unit of competency contain applicable facets of Employability Skills. The Employability Skills Summary of the qualification in which this unit of competency is packaged will assist in identifying Employability Skill requirements.

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Elements and Performance Criteria Pre-Content

6) Elements describe the essential outcomes of a competency standard unit	Performance Criteria describe the required performance needed to demonstrate achievement of the element. Assessment of performance is to be consistent with the Evidence Guide.

Elements and Performance Criteria

ELEMENT	PERFORMANCE CRITERIA	
1 Prepare to wind coils.	1.1	OHS procedures for a given work area are identified, obtained and understood.
	1.2	Established OHS risk control measures for work preparation are followed.
	1.3	Work instructions are identified, obtained and understood.
	1.4	Advice is sought from the work supervisor to ensure the work is coordinated effectively with others.
	1.5	Materials required for the work are obtained in accordance with established routines and procedures.
	1.6	Tools, equipment and testing devices needed to carry out the work are obtained and checked for correct operation and safety.
2 Wind coils.	2.1	Established OHS risk control work measures are followed.
	2.2	Winding machines are checked as being isolated where necessary in strict accordance OHS requirements and procedures.
	2.3	Winding wire and insulation is selected in accordance with work instructions and established routines.
	2.4	Winding formers and machine is set-up in accordance with routine instructions.

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ELEMENT	PERFORMANCE CRITERIA	
	2.5	Prescribed solutions are used to resolve work completion issues.
	2.6	Routine quality checks are conducted to ensure coils are correctly wound with correct wire, number of turns and shape.
	2.7	Work is completed in acceptable timeframe given environment and workplace conditions.
3 Complete work report.	3.1	OHS measures work completion risk control are followed.
	3.2	Work report forms/data sheets are completed accurately.

Required Skills and Knowledge

REQUIRED SKILLS AND KNOWLEDGE

8) This describes the essential skills and knowledge and their level, required for this unit.

Evidence shall show that knowledge has been acquired of safe working practices and winding coils.

All knowledge and skills detailed in this unit should be contextualised to current industry practices and technologies

KS01-EG150A Coil winding and coil testing

Evidence shall show an understanding of coil winding and coil testing to an extent indicated by the following aspects:

T1 Coil data to be collected:

- Type of wire.
- Gauge.
- Number of turns.
- Type of coil.
- Type of insulation.
- Coil shape.

T2 Coil former types and construction/set up

- Coil shapes
- Factors which govern coil shape:

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REQUIRED SKILLS AND KNOWLEDGE

- end room;
- coil flexibility;
- bore size of stator iron core;
- depth of iron below the slots, in the iron core;
- pressure points between the coils
- Types coil winding formers

T3 Coil winding machines

- Identify machine types:
- foot pedal,
- variable speed,
- winding head fitted with a chuck;
- Remote foot switch on a flexible lead, variable speed fitted with a face plate;
- layer winding machine;
- computer operated
- Operational safety precautions

T4 Coil insulations.

- Purpose
- Temperature ratings
- Common insulating materials
- Polyester film backed elephantide; Nomex;
- Mylar;
- Nomex/mylar/nomex; Dacron/mylar/dacron;
- cloth, tape, and adhesive tape (glass); polyester glass laminate;
- sheet, tape, and adhesive tape (polyester film);
- Bakelite paper laminates

T5 Rewind small and medium size solenoid coils

- Strip and record data
- Prepare/insulate coil formers
- Wind each type of coil
- Finishing off process
- Test procedures

T6 Types of testing devices

- Multimeter;
- Series light;
- Insulation resistance tester;
- Wheatstone bridge

T7 Purpose of testing devices

- Multimeter;

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REQUIRED SKILLS AND KNOWLEDGE

- Series lamp;
- Insulation resistance tester;
- Wheatstone bridge

T8 Types of tests

- Continuity
- Short circuited turns
- Insulation resistance

T9 Testing techniques to identify faulty coils

- Physical inspection.
- Using a testing device.

Evidence Guide

EVIDENCE GUIDE

9) The evidence guide provides advice on assessment and must be read in conjunction with the Performance Criteria, Required Skills and Knowledge, the Range Statement and the Assessment Guidelines for this Training Package.

The Evidence Guide forms an integral part of this unit. It must be used in conjunction with all parts of this unit and performed in accordance with the Assessment Guidelines of this Training Package.

Overview of Assessment **9.1)**

Longitudinal competency development approaches to assessment, such as Profiling, require data to be reliably gathered in a form that can be consistently interpreted over time. This approach is best utilised in Apprenticeship programs and reduces assessment intervention. It is the Industry's preferred model for apprenticeships. However, where summative (or final) assessment is used it is to include the application of the competency in the normal work environment or, at a minimum, the application of the competency in a realistically simulated work environment. It is recognised that, in some circumstances, assessment in part or full can occur outside the workplace. However, it must be in accordance with industry and regulatory policy.

Methods chosen for a particular assessment will be influenced by various factors. These include the extent of the assessment, the

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most effective locations for the assessment activities to take place, access to physical resources, additional safety measures that may be required and the critical nature of the competencies being assessed.

The critical safety nature of working with electricity, electrical equipment, gas or any other hazardous substance/material carries risk in deeming a person competent. Sources of evidence need to be 'rich' in nature to minimise error in judgment.

Activities associated with normal every day work have a bearing on the decision as to how much and how detailed the data gathered will contribute to its 'richness'. Some skills are more critical to safety and operational requirements while the same skills may be more or less frequently practised. These points are raised for the assessors to consider when choosing an assessment method and developing assessment instruments. Sample assessment instruments are included for Assessors in the Assessment Guidelines of this Training Package.

Critical aspects of evidence required to demonstrate competency in this unit

9.2)

Before the critical aspects of evidence are considered all prerequisites shall be met.

Evidence for competence in this unit shall be considered holistically. Each element and associated performance criteria shall be demonstrated on at least two occasions in accordance with the 'Assessment Guidelines – UEE11'. Evidence shall also comprise:

- A representative body of work performance demonstrated within the timeframes typically expected of the discipline, work function and industrial environment. In particular this shall incorporate evidence that shows a candidate is able to:
  - Implement Occupational Health and Safety workplace procedures and practices including the use of risk control measures as specified in the performance criteria and range statement
  - Apply sustainable energy principles and practices as specified in the performance criteria and range statement
  - Demonstrate an understanding of the essential knowledge and associated skills as described in this unit. It may be

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required by some jurisdictions that RTOs provide a percentile graded result for the purpose of regulatory or licensing requirements.

- Demonstrate an appropriate level of skills enabling employment
- Conduct work observing the relevant Anti Discrimination legislation, regulations, polices and workplace procedures

- Demonstrated consistent performance across a representative range of contexts from the prescribed items below:
  - Winding coils as described as described in 8) and including:

A Following winding specifications.

B Selecting correct winding wire and insulation.

C Setting up and operating winding machine.

D Adhering to quality procedures.

E Completing work report/forms accurately.

F Dealing with unplanned events by drawing on essential knowledge and skills to provide appropriate solutions incorporated in the holistic assessment with the above listed items.

Note:

Successful completion of relevant vendor training may be used to contribute to evidence on which competency is deemed. In these cases the alignment of outcomes of vendor training with performance criteria and critical aspects of evidence shall be clearly identified.

Context of and specific resources for assessment

9.3)

This unit should be assessed as it relates to normal work practice using procedures, information and resources typical of a workplace. This should include:

OHS policy and work procedures and instructions.

Suitable work environment, facilities, equipment and materials to undertake actual work as prescribed by this unit.

These should be part of the formal learning/assessment environment.

Note:

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Where simulation is considered a suitable strategy for assessment, conditions must be authentic and as far as possible reproduce and replicate the workplace and be consistent with the approved industry simulation policy.

The resources used for assessment should reflect current industry practices in relation to winding coils.

Method of assessment **9.4)**

This unit shall be assessed by methods given in Volume 1, Part 3 'Assessment Guidelines'.

Note:

Competent performance with inherent safe working practices is expected in the industry to which this unit applies. This requires assessment in a structured environment which is primarily intended for learning/assessment and incorporates all necessary equipment and facilities for learners to develop and demonstrate the essential knowledge and skills described in this unit.

Concurrent assessment and relationship with other units **9.5)**

There are no concurrent assessment recommendations for this unit.

The critical aspects of occupational health and safety covered in unit UEENEEE101A and other discipline specific occupational health and safety units shall be incorporated in relation to this unit.

Range Statement

RANGE STATEMENT

10) This relates to the unit as a whole providing the range of contexts and conditions to which the performance criteria apply. It allows for different work environments and situations that will affect performance.

This unit shall be demonstrated in relation to winding at least four different types of coils in an environment designed specifically for the purpose.

Generic terms used throughout this Vocational Standard shall be regarded as part of

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RANGE STATEMENT

the Range Statement in which competency is demonstrated. The definition of these and other terms that apply are given in Volume 2, Part 2.1.

Unit Sector(s)

Not applicable.

Competency Field

Competency Field **11)**

Electrical

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UEENEEG151A Place and connect electrical coils

Modification History

Not applicable.

Unit Descriptor

Unit Descriptor **1) Scope:**

1.1) Descriptor

This unit covers insulating, placing and connecting electrical coils, in an small armatures/stators, transformers and solenoid equipped devices. The unit encompasses working safely, using hand and powered tools, measuring, applying basic knowledge of electrical circuits, connecting conductors following technical instructions and set procedures and recording work activities.

Application of the Unit

Application of the Unit **2)**

This unit is intended for competency development entry-level employment based programs incorporated in approved contracts of training.

Licensing/Regulatory Information

License to practice **3)**

The skills and knowledge described in this unit do not require a license to practice in the workplace. However, practice in this unit is subject to regulations directly related to occupational health and safety and where applicable contracts of training such as apprenticeships.

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Pre-Requisites

Prerequisite Unit(s) **4)**

Competencies **4.1)**

Granting competency in this unit shall be made only after competency in the following unit(s) has/have been confirmed.

UEENEEE101A	Apply Occupational Health and Safety regulations, codes and practices in the workplace
UEENEEE102A	Fabricate, assemble and dismantle utilities industry components
UEENEEE104A	Solve problems in d.c. circuits
UEENEEE107A	Use drawings, diagrams, schedules, standards, codes and specifications
UEENEEG150A	Wind electrical coils

Literacy and numeracy skills **4.2)**

Participants are best equipped to achieve competency in this unit if they have reading, writing and numeracy skills indicated by the following scales. Description of each scale is given in Volume 2, Part 3 ‘Literacy and Numeracy’

Reading 3 Writing 3 Numeracy 3

Employability Skills Information

Employability Skills **5)**

This unit contains Employability Skills

The required outcomes described in this unit of competency contain applicable facets of Employability Skills. The Employability Skills Summary of the

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Employability Skills	**5)** qualification in which this unit of competency is packaged will assist in identifying Employability Skill requirements.

Elements and Performance Criteria Pre-Content

6) Elements describe the essential outcomes of a competency standard unit	Performance Criteria describe the required performance needed to demonstrate achievement of the element. Assessment of performance is to be consistent with the Evidence Guide.

Elements and Performance Criteria

ELEMENT		PERFORMANCE CRITERIA	
1	Prepare to place and connect coils.	1.1	OHS procedures for a given work area are identified, obtained and understood.
		1.2	Established OHS risk control measures for work preparation are followed.
		1.3	Work instructions are identified, obtained and understood.
		1.4	Advice is sought from the work supervisor to ensure the work is coordinated effectively with others.
		1.5	Materials required for the work are obtained in accordance with established routines and procedures.
		1.6	Tools, equipment and testing devices needed to carry out the work are obtained and checked for correct operation and safety.
2	Place and connect coils.	2.1	Established OHS risk control work measures are followed.
		2.2	Machines/equipment is checked as being isolated where necessary in strict accordance OHS requirements and procedures.

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ELEMENT	PERFORMANCE CRITERIA	
	2.3	Coils and insulation are selected in accordance with work instructions and established routines.
	2.4	Insulation is cut and applied in accordance with work instructions and established routines.
	2.5	Coils are place in accordance with work instructions and established routines.
	2.6	Coils ends are prepared and connections made in accordance with work instructions and established routines.
	2.7	Prescribed solutions are used to resolve work completion issues.
	2.8	Routine quality checks are conducted to ensure coils are correctly wound with correct wire, number of turns and shape.
	2.9	Work is completed in acceptable timeframe given environment and workplace conditions.
3 Complete work report.	3.1	OHS measures work completion risk control are followed.
	3.2	Work report forms/data sheets are completed accurately.

Required Skills and Knowledge

REQUIRED SKILLS AND KNOWLEDGE

8) This describes the essential skills and knowledge and their level, required for this unit.

Evidence shall show that knowledge has been acquired of safe working practices and placing and connecting coils.

All knowledge and skills detailed in this unit should be contextualised to current industry practices and technologies.

KS01-EG151A Electrical winding and connections

Evidence shall show an understanding of electrical winding and connections to an extent indicated by the following aspects:

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REQUIRED SKILLS AND KNOWLEDGE

T1 Winding wires.

- Types of winding wires.
- Winding wire varnishes.
- Varnish temperature ratings.
- Varnish removal methods.
- Types of varnish.
  - Air drying
  - Baking
  - Epoxy
- Dangers relating to handling
- Methods of application.
  - Brush.
  - Spray.
  - Dip.
  - Trickle.
- Measuring wires.
  - Gauge.
  - Micrometer.`

T2 Applications of winding wires

- Solenoid
- Stator windings
- Armature windings.
- Transformer windings
- Induction coils.

T3 Methods of winding wire connection

- Conductor preparation.
- Joining methods – soft soldering
  - Types of soldering irons and tips
  - Types of solder
  - Fluxes: purpose; types; dangers
  - Soldering process
  - Inspection
- Hard soldering - Silver soldering
  - Advantages
  - Types of silver soldering wire
  - Types of flux
  - Operation and safe working procedures with the oxy acetylene welding torch
  - Preparation of join

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REQUIRED SKILLS AND KNOWLEDGE

- Silver soldering process and inspection
- Fusing
  - Advantages
  - Preparation of join
  - Fusing process
  - Safe working procedures

T4 Insulation methods.

T5 Basic techniques in insulating coils for electrical static and rotating machines.

- Methods of insulating coils.
- Types of insulation used.
- Precautions.

T6 Coil types.

- Universal motor field coils (single phase);
- Distributed concentric coil group (single phase/three phase);
- Distributed “D” or mush shape coil group (three phase);
- Distributed round end (three phase);
- Distributed diamond shape coil group wound as individual coils (three phase)

T7 Basic techniques in placing coils for electrical static and rotating machines

- Record data
- Manufacture for universal field coils
- Coil finishing:
- insertion into slots;
- taping (where applicable);
- connection for correct polarity
- Electrical testing

Evidence Guide

EVIDENCE GUIDE

9) The evidence guide provides advice on assessment and must be read in conjunction with the Performance Criteria, Required Skills and Knowledge, the Range Statement and the Assessment Guidelines for this Training Package.

The Evidence Guide forms an integral part of this unit. It must be used in conjunction with all parts of this unit and performed in accordance with the Assessment Guidelines of this Training Package.

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Overview of Assessment **9.1)**

Longitudinal competency development approaches to assessment, such as Profiling, require data to be reliably gathered in a form that can be consistently interpreted over time. This approach is best utilised in Apprenticeship programs and reduces assessment intervention. It is the Industry's preferred model for apprenticeships. However, where summative (or final) assessment is used it is to include the application of the competency in the normal work environment or, at a minimum, the application of the competency in a realistically simulated work environment. It is recognised that, in some circumstances, assessment in part or full can occur outside the workplace. However, it must be in accordance with industry and regulatory policy.

Methods chosen for a particular assessment will be influenced by various factors. These include the extent of the assessment, the most effective locations for the assessment activities to take place, access to physical resources, additional safety measures that may be required and the critical nature of the competencies being assessed.

The critical safety nature of working with electricity, electrical equipment, gas or any other hazardous substance/material carries risk in deeming a person competent. Sources of evidence need to be 'rich' in nature to minimise error in judgment.

Activities associated with normal every day work have a bearing on the decision as to how much and how detailed the data gathered will contribute to its 'richness'. Some skills are more critical to safety and operational requirements while the same skills may be more or less frequently practised. These points are raised for the assessors to consider when choosing an assessment method and developing assessment instruments. Sample assessment instruments are included for Assessors in the Assessment Guidelines of this Training Package.

Critical aspects of evidence required to demonstrate competency in this unit **9.2)**

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Before the critical aspects of evidence are considered all prerequisites shall be met.

Evidence for competence in this unit shall be considered holistically. Each element and associated performance criteria shall be demonstrated on at least two occasions in accordance with the 'Assessment Guidelines – UEE11'. Evidence shall also comprise:

- A representative body of work performance demonstrated within the timeframes typically expected of the discipline, work function and industrial environment. In particular this shall incorporate evidence that shows a candidate is able to:
  - Implement Occupational Health and Safety workplace procedures and practices including the use of risk control measures as specified in the performance criteria and range statement
  - Apply sustainable energy principles and practices as specified in the performance criteria and range statement
  - Demonstrate an understanding of the essential knowledge and associated skills as described in this unit. It may be required by some jurisdictions that RTOs provide a percentile graded result for the purpose of regulatory or licensing requirements.
  - Demonstrate an appropriate level of skills enabling employment
  - Conduct work observing the relevant Anti Discrimination legislation, regulations, polices and workplace procedures
- Demonstrated consistent performance across a representative range of contexts from the prescribed items below:
  - Place and connect coils as described as described in 8) and including:

A	Following winding specifications.
B	Selecting correct coils and insulation.
C	Cutting insulation and place insulation and coils without damage.
D	Connecting coils correctly.
E	Adhering to quality procedures.
F	Completing work report/forms accurately.
G	Dealing with unplanned events by drawing on essential knowledge and skills to provide

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appropriate solutions incorporated in the holistic assessment with the above listed items.

Note:

Successful completion of relevant vendor training may be used to contribute to evidence on which competency is deemed. In these cases the alignment of outcomes of vendor training with performance criteria and critical aspects of evidence shall be clearly identified.

Context of and specific resources for assessment

9.3)

This unit should be assessed as it relates to normal work practice using procedures, information and resources typical of a workplace. This should include:

OHS policy and work procedures and instructions.

Suitable work environment, facilities, equipment and materials to undertake actual work as prescribed by this unit.

These should be part of the formal learning/assessment environment.

Note:

Where simulation is considered a suitable strategy for assessment, conditions must be authentic and as far as possible reproduce and replicate the workplace and be consistent with the approved industry simulation policy.

The resources used for assessment should reflect current industry practices in relation to placing and connecting coils.

Method of assessment

9.4)

This unit shall be assessed by methods given in Volume 1, Part 3 ‘Assessment Guidelines’.

Note:

Competent performance with inherent safe working practices is expected in the industry to which this unit applies. This requires assessment in a structured environment which is primarily intended for learning/assessment and incorporates all necessary

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equipment and facilities for learners to develop and demonstrate the essential knowledge and skills described in this unit.

Concurrent assessment and relationship with other units **9.5)**

There are no concurrent assessment recommendations for this unit.

The critical aspects of occupational health and safety covered in unit UEENEEE101A and other discipline specific occupational health and safety units shall be incorporated in relation to this unit.

Range Statement

RANGE STATEMENT

10) This relates to the unit as a whole providing the range of contexts and conditions to which the performance criteria apply. It allows for different work environments and situations that will affect performance.

This unit shall be demonstrated in relation to placing and connecting electrical coils for a small armatures/stators and single phase transformers or solenoid equipped devices in an environment designed specifically for the purpose.

Generic terms used throughout this Vocational Standard shall be regarded as part of the Range Statement in which competency is demonstrated. The definition of these and other terms that apply are given in Volume 2, Part 2.1.

Unit Sector(s)

Not applicable.

Competency Field

Competency Field **11)**

Electrical

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UEENEEG153A Rewind three phase low voltage induction machines

Modification History

Not applicable.

Unit Descriptor

Unit Descriptor **1) Scope:**

1.1) Descriptor

This unit covers preparing, placing and connecting coils and insulating three phase stators and rotors. It encompasses working safely, using hand and powered tools, measuring, applying knowledge of electrical circuits and stator windings, using testing devices, applying technical and quality standards and keeping winding records.

Application of the Unit

Application of the Unit **2)**

This unit is intended for competency development entry-level employment based programs incorporated in approved contracts of training.

Licensing/Regulatory Information

License to practice **3)**

The skills and knowledge described in this unit do not require a license to practice in the workplace. However, practice in this unit is subject to regulations directly related to occupational health and safety and where applicable contracts of training such as apprenticeships.

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Pre-Requisites

Prerequisite Unit(s) **4)**

Competencies **4.1)**

Granting competency in this unit shall be made only after competency in the following unit(s) has/have been confirmed.

UEENEEE101A	Apply Occupational Health and Safety regulations, codes and practices in the workplace
UEENEEE102A	Fabricate, assemble and dismantle utilities industry components
UEENEEE104A	Solve problems in d.c. circuits
UEENEEE105A	Fix and secure electrotechnology equipment
UEENEEE107A	Use drawings, diagrams, schedules, standards, codes and specifications
UEENEEG006A	Solve problems in single and three phase low voltage machines
UEENEEG101A	Solve problems in electromagnetic devices and related circuits
UEENEEG102A	Solve problems in low voltage a.c. circuits
UEENEEG106A	Terminate cables, cords and accessories for low voltage circuits
UEENEEG150A	Wind electrical coils
UEENEEG151A	Place and connect electrical coils

Literacy and numeracy skills **4.2)**

Participants are best equipped to achieve competency in

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this unit if they have reading, writing and numeracy skills indicated by the following scales. Description of each scale is given in Volume 2, Part 3 'Literacy and Numeracy'

Reading 4 Writing 4 Numeracy 4

Employability Skills Information

Employability Skills **5)**

This unit contains Employability Skills

The required outcomes described in this unit of competency contain applicable facets of Employability Skills. The Employability Skills Summary of the qualification in which this unit of competency is packaged will assist in identifying Employability Skill requirements.

Elements and Performance Criteria Pre-Content

6) Elements describe the essential outcomes of a competency standard unit

Performance Criteria describe the required performance needed to demonstrate achievement of the element. Assessment of performance is to be consistent with the Evidence Guide.

Elements and Performance Criteria

ELEMENT	PERFORMANCE CRITERIA
1 Prepare to rewind three phase induction machines.	1.1 OHS procedures for a given work area are identified, obtained and understood.
	1.2 Established OHS risk control measures for work preparation are followed.
	1.3 The extent of the work is determined from job sheets, specifications and regulatory requirements.
	1.4 Advice is sought from the work supervisor to

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ELEMENT	PERFORMANCE CRITERIA	
		ensure the work is coordinated effectively with others.
	1.5	Induction machine is dismantled and parts tagged and stored to prevent loss or damage.
	1.6	Winding data is obtained from winding data records or directly from measurements of stator and recorded in accordance with established procedures.
	1.7	Winding is stripped from stator in accordance with established procedures.
	1.8	Materials required for the work are obtained in accordance with established procedures and procedures.
	1.9	Tools, equipment and testing devices needed to carry out the work are obtained and checked for correct operation and safety.
2 Rewind three phase induction machines.	2.1	Established OHS risk control work measures are followed.
	2.2	Machines/equipment are checked as being isolated where necessary in strict accordance OHS requirements and procedures.
	2.3	Induction machine is dismantled and parts tagged and stored to prevent loss or damage.
	2.4	Winding is stripped from stator in accordance with established procedures.
	2.5	Stator is wound and insulated in accordance with winding data and established procedures.
	2.6	Machine is assembled and prepares for final testing in accordance with established procedures.
	2.7	Prescribed solutions are used to resolve work completion issues.
	2.8	Routine quality checks are conducted to ensure coils are correctly wound with correct

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ELEMENT	PERFORMANCE CRITERIA	
		wire, number of turns and shape.
	2.9	Work is completed in acceptable timeframe given environment and workplace conditions.
3 Complete work report.	3.1	OHS measures work completion risk control is followed.
	3.2	Work report forms/data sheets are completed accurately in accordance with established procedures.

Required Skills and Knowledge

REQUIRED SKILLS AND KNOWLEDGE

8) This describes the essential skills and knowledge and their level, required for this unit.

Evidence shall show that knowledge has been acquired of safe working practices and rewinding three phase induction machines rated for low voltage.

All knowledge and skills detailed in this unit should be contextualised to current industry practices and technologies.

KS01-EG153A Low voltage three phase motor winding techniques

Evidence shall show an understanding of single phase machine winding to an extent indicated by the following aspects:

T1 Alternator windings encompassing:

- Elementary single-phase stator winding
- Elementary three-phase stator winding
- Half-coil and whole-coil windings
- Concentrated and distributed windings
- Chain, lap and wave windings
- Pole-pitch and coil-span
- Half-coil winding for a three-phase alternator
- Whole-coil stator winding for a three-phase alternator

T2 Rating, cooling and regulation encompassing:

- Rating of alternators
- Cooling of alternators
- The voltage regulator

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REQUIRED SKILLS AND KNOWLEDGE

T3 Testing techniques encompassing:

- Continuity
- Insulation testing
- Use of ‘growler’
- Magnetic field testing

T4 Techniques of winding three phase motors.

- Electrical machine insulation types and applications
- Coil placement techniques
- Coil connection arrangements and terminations
- Winding insulation methods

Evidence Guide

EVIDENCE GUIDE

9) The evidence guide provides advice on assessment and must be read in conjunction with the Performance Criteria, Required Skills and Knowledge, the Range Statement and the Assessment Guidelines for this Training Package.

The Evidence Guide forms an integral part of this unit. It must be used in conjunction with all parts of this unit and performed in accordance with the Assessment Guidelines of this Training Package.

Overview of Assessment **9.1)**

Longitudinal competency development approaches to assessment, such as Profiling, require data to be reliably gathered in a form that can be consistently interpreted over time. This approach is best utilised in Apprenticeship programs and reduces assessment intervention. It is the Industry’s preferred model for apprenticeships. However, where summative (or final) assessment is used it is to include the application of the competency in the normal work environment or, at a minimum, the application of the competency in a realistically simulated work environment. It is recognised that, in some circumstances, assessment in part or full can occur outside the workplace. However, it must be in accordance with industry and regulatory policy.

Methods chosen for a particular assessment will be influenced by various factors. These include the extent of the assessment, the

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most effective locations for the assessment activities to take place, access to physical resources, additional safety measures that may be required and the critical nature of the competencies being assessed.

The critical safety nature of working with electricity, electrical equipment, gas or any other hazardous substance/material carries risk in deeming a person competent. Sources of evidence need to be 'rich' in nature to minimise error in judgment.

Activities associated with normal every day work have a bearing on the decision as to how much and how detailed the data gathered will contribute to its 'richness'. Some skills are more critical to safety and operational requirements while the same skills may be more or less frequently practised. These points are raised for the assessors to consider when choosing an assessment method and developing assessment instruments. Sample assessment instruments are included for Assessors in the Assessment Guidelines of this Training Package.

Critical aspects of evidence required to demonstrate competency in this unit

9.2)

Before the critical aspects of evidence are considered all prerequisites shall be met.

Evidence for competence in this unit shall be considered holistically. Each element and associated performance criteria shall be demonstrated on at least two occasions in accordance with the 'Assessment Guidelines – UEE11'. Evidence shall also comprise:

- A representative body of work performance demonstrated within the timeframes typically expected of the discipline, work function and industrial environment. In particular this shall incorporate evidence that shows a candidate is able to:
  - Implement Occupational Health and Safety workplace procedures and practices including the use of risk control measures as specified in the performance criteria and range statement
  - Apply sustainable energy principles and practices as specified in the performance criteria and range statement
  - Demonstrate an understanding of the essential knowledge and associated skills as described in this unit. It may be

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required by some jurisdictions that RTOs provide a percentile graded result for the purpose of regulatory or licensing requirements.

- Demonstrate an appropriate level of skills enabling employment
- Conduct work observing the relevant Anti Discrimination legislation, regulations, polices and workplace procedures

- Demonstrated consistent performance across a representative range of contexts from the prescribed items below:
  - Rewind three phase induction machines rated for low voltage as described as described in 8) and including:

A Dismantling machine and storing parts securely.

B Preparing stator for winding.

C Following winding specifications.

D Selecting correct coils and insulation.

E Winding and connecting stator correctly.

F Assembling machine and preparing for testing.

G Adhering to quality procedures.

H Completing work report/forms accurately.

I Dealing with unplanned events by drawing on essential knowledge and skills to provide appropriate solutions incorporated in the holistic assessment with the above listed items.

Note:

Successful completion of relevant vendor training may be used to contribute to evidence on which competency is deemed. In these cases the alignment of outcomes of vendor training with performance criteria and critical aspects of evidence shall be clearly identified.

Context of and specific resources for assessment

9.3)

This unit should be assessed as it relates to normal work practice using procedures, information and resources typical of a workplace. This should include:

OHS policy and work procedures and instructions.

Suitable work environment, facilities, equipment and materials to undertake actual work as prescribed by this unit.

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These should be part of the formal learning/assessment environment.

Note:

Where simulation is considered a suitable strategy for assessment, conditions must be authentic and as far as possible reproduce and replicate the workplace and be consistent with the approved industry simulation policy.

The resources used for assessment should reflect current industry practices in relation to rewinding three phase induction machines rated for low voltage.

Method of assessment **9.4)**

This unit shall be assessed by methods given in Volume 1, Part 3 'Assessment Guidelines'.

Note:

Competent performance with inherent safe working practices is expected in the industry to which this unit applies. This requires assessment in a structured environment which is primarily intended for learning/assessment and incorporates all necessary equipment and facilities for learners to develop and demonstrate the essential knowledge and skills described in this unit.

Concurrent assessment and relationship with other units **9.5)**

For optimisation of training and assessment effort, competency development in this unit may be arranged concurrently with unit:

UEENEEG15 Conduct electrical tests on LV electrical machines 7A

The critical aspects of occupational health and safety covered in unit UEENEEE101A and other discipline specific occupational health and safety units shall be incorporated in relation to this unit.

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Range Statement

RANGE STATEMENT

10) This relates to the unit as a whole providing the range of contexts and conditions to which the performance criteria apply. It allows for different work environments and situations that will affect performance.

This unit shall be demonstrated in relation to dismantling and winding stators for at least three different three-phase induction machines in an environment designed specifically for the purpose.

Generic terms used throughout this Vocational Standard shall be regarded as part of the Range Statement in which competency is demonstrated. The definition of these and other terms that apply are given in Volume 2, Part 2.1.

Unit Sector(s)

Not applicable.

Competency Field

Competency Field	**11)**
	Electrical

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UEENEEG157A Conduct electrical tests on LV electrical machines

Modification History

Not applicable.

Unit Descriptor

Unit Descriptor **1) Scope:**

1.1) Descriptor

This unit covers electrical safety and functional testing of electrical machines designed to operate at low voltage. The unit encompasses working safely, setting up and conducting continuity, insulation and short circuit and inspection and testing of iron circuit, interpreting and documenting test results and any resulting corrective actions.

Application of the Unit

Application of the Unit **2)**

This unit is intended for competency development entry-level employment based programs incorporated in approved contracts of training.

Licensing/Regulatory Information

License to practice **3)**

The skills and knowledge described in this unit may require a license to practice in the workplace subject to regulations for undertaking of electrical work. Practice in workplace and during training is also subject to regulations directly related to occupational health and safety and where applicable contracts of training such as apprenticeships.

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Pre-Requisites

Prerequisite Unit(s) **4)**

Competencies **4.1)**

Granting competency in this unit shall be made only after competency in the following unit(s) has/have been confirmed.

UEENEEE101A	Apply Occupational Health and Safety regulations, codes and practices in the workplace
UEENEEE102A	Fabricate, assemble and dismantle utilities industry components
UEENEEE104A	Solve problems in d.c. circuits
UEENEEE105A	Fix and secure electrotechnology equipment
UEENEEE107A	Use drawings, diagrams, schedules, standards, codes and specifications
UEENEEG006A	Solve problems in single and three phase low voltage machines
UEENEEG101A	Solve problems in electromagnetic devices and related circuits
UEENEEG102A	Solve problems in low voltage a.c. circuits
UEENEEG106A	Terminate cables, cords and accessories for low voltage circuits

AND

UEENEEG150A	Wind electrical coils
UEENEEG151A	Place and connect electrical coils
UEENEEG1	Rewind three phase low voltage induction

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Prerequisite Unit(s) **4)**

53A	machines
OR	
UEENEEG033A	Solve problems in single and three phase electrical apparatus and circuits
UEENEEG063A	Arrange circuits, control and protection for general electrical installations
UEENEEG108A	Trouble-shoot and repair faults in low voltage electrical apparatus and circuits

Literacy and numeracy skills **4.2)**

Participants are best equipped to achieve competency in this unit if they have reading, writing and numeracy skills indicated by the following scales. Description of each scale is given in Volume 2, Part 3 ‘Literacy and Numeracy’

Reading	4	Writing	4	Numeracy	4

Employability Skills Information

Employability Skills **5)**

This unit contains Employability Skills

The required outcomes described in this unit of competency contain applicable facets of Employability Skills. The Employability Skills Summary of the qualification in which this unit of competency is packaged will assist in identifying Employability Skill requirements.

Elements and Performance Criteria Pre-Content

6) Elements describe the essential outcomes of a	Performance Criteria describe the required performance needed to demonstrate achievement of the element. Assessment of performance is to be consistent with the

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competency standard unit | Evidence Guide.

Elements and Performance Criteria

ELEMENT	PERFORMANCE CRITERIA
1 Prepare to conduct electrical tests on three phase induction machines.	1.1 OHS procedures for a given work area are identified, obtained and understood.
	1.2 Established OHS risk control measures for work preparation are followed.
	1.3 The extent of the work is determined from job sheets, specifications and regulatory requirements.
	1.4 Advice is sought from the work supervisor to ensure the work is coordinated effectively with others.
	1.5 Winding data is obtained from winding data records or directly from measurements of stator and recorded in accordance with established procedures.
	1.6 Winding is stripped from stator in accordance with established procedures.
	1.7 Materials required for the work are obtained in accordance with established procedures.
	1.8 Tools, equipment and testing devices needed to carry out the work are obtained and checked for correct operation and safety.
2 Conduct electrical tests on three phase induction machines.	2.1 Established OHS risk control work measures are followed.
	2.2 Machines/equipment are checked as being isolated where necessary in strict accordance OHS requirements and procedures.
	2.3 All necessary electrical tests are conducted to established cause of faults or operational condition of the machine.
	2.4 Status of the machine is determined from test

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ELEMENT	PERFORMANCE CRITERIA	
		results and recorded.
	2.5	Prescribed solutions are used to resolve work completion issues.
	2.6	Routine quality checks are conducted to ensure coils are correctly wound with correct wire, number of turns and shape.
	2.7	Work is completed in acceptable timeframe given environment and workplace conditions.
3 Complete work report.	3.1	OHS measures work completion risk controls are followed.
	3.2	The status of the machine is documented in accordance with established procedures and appropriate person(s) notified.

Required Skills and Knowledge

REQUIRED SKILLS AND KNOWLEDGE

8) This describes the essential skills and knowledge and their level, required for this unit.

Evidence shall show that knowledge has been acquired of safe working practices and conducting electrical tests on low voltage electrical machines.

All knowledge and skills detailed in this unit should be contextualised to current industry practices and technologies.

KS01-EG157A Low voltage motor testing devices and techniques

Evidence shall show an understanding of electric motor mechanical measuring and testing devices and techniques to an extent indicated by the following aspects:

T1 Test/measuring devices and their application

- Test/measuring devices
  - multimeter.
  - growler.
  - Insulation resistance tester
  - Hi-pot testing
- Application.
  - continuity.

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REQUIRED SKILLS AND KNOWLEDGE

- insulation.
- short circuit
- testing of magnetic circuit.

T2 Connection of test/measuring devices into a circuit encompassing:

- safety procedures.
- circuit arrangement of test/measuring devices.

T3 Taking and interpreting readings

With regards to:

- continuity.
- insulation.
- short circuit
- testing of magnetic circuit.

T4 Storage, maintenance and care of test/measuring devices

- Storage.
- Maintenance
- Care.

Evidence Guide

EVIDENCE GUIDE

9) The evidence guide provides advice on assessment and must be read in conjunction with the Performance Criteria, Required Skills and Knowledge, the Range Statement and the Assessment Guidelines for this Training Package.

The Evidence Guide forms an integral part of this unit. It must be used in conjunction with all parts of this unit and performed in accordance with the Assessment Guidelines of this Training Package.

Overview of Assessment	**9.1)**
	Longitudinal competency development approaches to assessment, such as Profiling, require data to be reliably gathered in a form that can be consistently interpreted over time. This approach is best utilised in Apprenticeship programs and reduces assessment intervention. It is the Industry's preferred model for apprenticeships. However, where summative (or final) assessment is used it is to include the application of the competency in the

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normal work environment or, at a minimum, the application of the competency in a realistically simulated work environment. It is recognised that, in some circumstances, assessment in part or full can occur outside the workplace. However, it must be in accordance with industry and regulatory policy.

Methods chosen for a particular assessment will be influenced by various factors. These include the extent of the assessment, the most effective locations for the assessment activities to take place, access to physical resources, additional safety measures that may be required and the critical nature of the competencies being assessed.

The critical safety nature of working with electricity, electrical equipment, gas or any other hazardous substance/material carries risk in deeming a person competent. Sources of evidence need to be 'rich' in nature to minimise error in judgment.

Activities associated with normal every day work have a bearing on the decision as to how much and how detailed the data gathered will contribute to its 'richness'. Some skills are more critical to safety and operational requirements while the same skills may be more or less frequently practised. These points are raised for the assessors to consider when choosing an assessment method and developing assessment instruments. Sample assessment instruments are included for Assessors in the Assessment Guidelines of this Training Package.

Critical aspects of evidence required to demonstrate competency in this unit

9.2)

Before the critical aspects of evidence are considered all prerequisites shall be met.

Evidence for competence in this unit shall be considered holistically. Each element and associated performance criteria shall be demonstrated on at least two occasions in accordance with the 'Assessment Guidelines – UEE11'. Evidence shall also comprise:

- A representative body of work performance demonstrated within the timeframes typically expected of the discipline, work function and industrial environment. In particular this shall incorporate evidence that shows a candidate is able to:
  - Implement Occupational Health and Safety workplace

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procedures and practices including the use of risk control measures as specified in the performance criteria and range statement

- Apply sustainable energy principles and practices as specified in the performance criteria and range statement
- Demonstrate an understanding of the essential knowledge and associated skills as described in this unit. It may be required by some jurisdictions that RTOs provide a percentile graded result for the purpose of regulatory or licensing requirements.
- Demonstrate an appropriate level of skills enabling employment
- Conduct work observing the relevant Anti Discrimination legislation, regulations, polices and workplace procedures

- Demonstrated consistent performance across a representative range of contexts from the prescribed items below:
  - Conduct electrical tests on low voltage electrical machines as described as described in 8) and including:

A Dismantling machine and storing parts securely.

B Setting up tests correctly.

C Taking test reading accurately.

D Determining the status of the machine correctly from test result.

E Documenting the status of the machine clearly.

F Dealing with unplanned events by drawing on essential knowledge and skills to provide appropriate solutions incorporated in the holistic assessment with the above listed items.

Note:

Successful completion of relevant vendor training may be used to contribute to evidence on which competency is deemed. In these cases the alignment of outcomes of vendor training with performance criteria and critical aspects of evidence shall be clearly identified.

Context of and specific resources for assessment

9.3)

This unit should be assessed as it relates to normal work practice using procedures, information and resources typical of a

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workplace. This should include:

OHS policy and work procedures and instructions.

Suitable work environment, facilities, equipment and materials to undertake actual work as prescribed by this unit.

These should be part of the formal learning/assessment environment.

Note:

Where simulation is considered a suitable strategy for assessment, conditions must be authentic and as far as possible reproduce and replicate the workplace and be consistent with the approved industry simulation policy.

The resources used for assessment should reflect current industry practices in relation to conducting electrical tests on low voltage electrical machines.

Method of assessment **9.4)**

This unit shall be assessed by methods given in Volume 1, Part 3 'Assessment Guidelines'.

Note:

Competent performance with inherent safe working practices is expected in the industry to which this unit applies. This requires assessment in a structured environment which is primarily intended for learning/assessment and incorporates all necessary equipment and facilities for learners to develop and demonstrate the essential knowledge and skills described in this unit.

Concurrent assessment and relationship with other units **9.5)**

For optimisation of training and assessment effort, competency development in this unit may be arranged concurrently with unit:

UEENEEG108A	Trouble-shoot and repair faults in low voltage electrical apparatus and circuits

OR

UEENEEG15	Rewind three phase low voltage induction

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3A machines

The critical aspects of occupational health and safety covered in unit UEENEEE101A and other discipline specific occupational health and safety units shall be incorporated in relation to this unit.

Range Statement

RANGE STATEMENT

10) This relates to the unit as a whole providing the range of contexts and conditions to which the performance criteria apply. It allows for different work environments and situations that will affect performance.

This unit shall be demonstrated in relation to conducting electrical tests on at least two different low voltage electrical machines with one of the machines having at least two winding faults. The purpose of the tests is to establishing:

- The causes of faults in machines, and
- Whether a machine has been correctly repaired and complies with all requirements

Generic terms used throughout this Vocational Standard shall be regarded as part of the Range Statement in which competency is demonstrated. The definition of these and other terms that apply are given in Volume 2, Part 2.1.

Unit Sector(s)

Not applicable.

Competency Field

Competency Field **11)**

Electrical

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UEENEEG159A Conduct mechanical tests on electrical machines and components

Modification History

Not applicable.

Unit Descriptor

Unit Descriptor **1) Scope:**

1.1) Descriptor

This unit covers mechanical safety and functional testing of electrical machines and their mechanical components. The unit encompasses working safely, setting up and conducting tests, taking measurements, interpreting and documenting test results and any resulting corrective actions.

Application of the Unit

Application of the Unit **2)**

This unit is intended for competency development entry-level employment based programs incorporated in approved contracts of training.

Licensing/Regulatory Information

License to practice **3)**

The skills and knowledge described in this unit may require a license to practice in the workplace subject to regulations for undertaking of electrical work. Practice in workplace and during training is also subject to regulations directly related to occupational health and safety and where applicable contracts of training such as apprenticeships.

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Pre-Requisites

Prerequisite Unit(s) **4)**

Competencies **4.1)**

Granting competency in this unit shall be made only after competency in the following unit(s) has/have been confirmed.

UEENEEG157A	Conduct electrical tests on LV electrical machines
UEENEEE101A	Apply Occupational Health and Safety regulations, codes and practices in the workplace
UEENEEE102A	Fabricate, assemble and dismantle utilities industry components
UEENEEE104A	Solve problems in d.c. circuits
UEENEEE105A	Fix and secure electrotechnology equipment
UEENEEE107A	Use drawings, diagrams, schedules, standards, codes and specifications
UEENEEG006A	Solve problems in single and three phase low voltage machines
UEENEEG101A	Solve problems in electromagnetic devices and related circuits
UEENEEG102A	Solve problems in low voltage a.c. circuits
UEENEEG106A	Terminate cables, cords and accessories for low voltage circuits

AND

UEENEEG150A	Wind electrical coils
UEENEEG151A	Place and connect electrical coils
UEENEEG1	Rewind three phase low voltage induction

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Prerequisite Unit(s) **4)**

53A	machines
OR	
UEENEEG033A	Solve problems in single and three phase electrical apparatus and circuits
UEENEEG063A	Arrange circuits, control and protection for general electrical installations
UEENEEG108A	Trouble-shoot and repair faults in low voltage electrical apparatus and circuits

Literacy and numeracy skills **4.2)**

Participants are best equipped to achieve competency in this unit if they have reading, writing and numeracy skills indicated by the following scales. Description of each scale is given in Volume 2, Part 3 ‘Literacy and Numeracy’

Reading	4	Writing	4	Numeracy	4

Employability Skills Information

Employability Skills **5)**

This unit contains Employability Skills

The required outcomes described in this unit of competency contain applicable facets of Employability Skills. The Employability Skills Summary of the qualification in which this unit of competency is packaged will assist in identifying Employability Skill requirements.

Elements and Performance Criteria Pre-Content

6) Elements describe the essential outcomes of a	Performance Criteria describe the required performance needed to demonstrate achievement of the element. Assessment of performance is to be consistent with the

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competency standard unit Evidence Guide.

Elements and Performance Criteria

ELEMENT	PERFORMANCE CRITERIA
1 Prepare to conduct mechanical tests on electrical machines.	1.1 OHS procedures for a given work area are identified, obtained and understood.
	1.2 Established OHS risk control measures for work preparation are followed.
	1.3 The extent of the work is determined from job sheets, specifications and regulatory requirements.
	1.4 Advice is sought from the work supervisor to ensure the work is coordinated effectively with others.
	1.5 Machine data is obtained from data records or directly from measurements and recorded in accordance with established procedures.
	1.6 Winding is stripped from stator in accordance with established procedures.
	1.7 Materials required for the work are obtained in accordance with established procedures.
	1.8 Tools, equipment and testing devices needed to carry out the work are obtained and checked for correct operation and safety.
2 Conduct mechanical tests on three phase induction machines.	2.1 Established OHS risk control work measures are followed.
	2.2 Machines/equipment are checked as being isolated where necessary in strict accordance OHS requirements and procedures. Note: Particular attention shall be given to following risk control measure related to high voltage hazards
	2.3 All necessary mechanical tests/measurements are

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ELEMENT	PERFORMANCE CRITERIA	
		conducted to established cause of faults or operational condition of the machine.
	2.4	Status of the machine is determined from test results and recorded.
	2.5	Prescribed solutions are used to resolve work completion issues.
	2.6	Routine quality checks are conducted to ensure coils are correctly wound with correct wire, number of turns and shape.
	2.7	Work is completed in acceptable timeframe given environment and workplace conditions.
3 Complete work report.	3.1	OHS measures work completion risk controls are followed.
	3.2	The status of the machine including specifications for any repair work required is documented in accordance with established procedures and appropriate person(s) notified.

Required Skills and Knowledge

REQUIRED SKILLS AND KNOWLEDGE

8) This describes the essential skills and knowledge and their level, required for this unit.

Evidence shall show that knowledge has been acquired of safe working practices and conducting mechanical tests on electrical machines.

All knowledge and skills detailed in this unit should be contextualised to current industry practices and technologies.

KS01-EG159A Electric motor mechanical measuring and testing devices and techniques

Evidence shall show an understanding of electric motor mechanical measuring and testing devices and techniques to an extent indicated by the following aspects:

T1 Devices and techniques for measuring geometric attributes encompassing:

- Measuring device for geometric attributes.
- Dynamic balancing.

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REQUIRED SKILLS AND KNOWLEDGE

- Alignment of shafts.

T2 Operational Test/measuring devices and their application encompassing:

- Operational test/measuring devices.
- Applications.

T3 Setting up test/measuring devices encompassing:

- safety procedures
- set up procedures

T4 Taking and interpreting readings encompassing:

- Correct method.
  - Taking and interpreting reading
  - Dynamic balancing
  - Aligning shafts
  - Measuring roundness

T5 Storage, maintenance and care of test/measuring devices encompassing:

- Storage of mechanical measuring and testing devices.
- maintenance of mechanical measuring and testing devices.
- Care of mechanical measuring and testing devices

Evidence Guide

EVIDENCE GUIDE

9) The evidence guide provides advice on assessment and must be read in conjunction with the Performance Criteria, Required Skills and Knowledge, the Range Statement and the Assessment Guidelines for this Training Package.

The Evidence Guide forms an integral part of this unit. It must be used in conjunction with all parts of this unit and performed in accordance with the Assessment Guidelines of this Training Package.

Overview of Assessment	**9.1)**
	Longitudinal competency development approaches to assessment, such as Profiling, require data to be reliably gathered in a form that can be consistently interpreted over time. This approach is best utilised in Apprenticeship programs and reduces assessment intervention. It is the Industry's preferred model for

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apprenticeships. However, where summative (or final) assessment is used it is to include the application of the competency in the normal work environment or, at a minimum, the application of the competency in a realistically simulated work environment. It is recognised that, in some circumstances, assessment in part or full can occur outside the workplace. However, it must be in accordance with industry and regulatory policy.

Methods chosen for a particular assessment will be influenced by various factors. These include the extent of the assessment, the most effective locations for the assessment activities to take place, access to physical resources, additional safety measures that may be required and the critical nature of the competencies being assessed.

The critical safety nature of working with electricity, electrical equipment, gas or any other hazardous substance/material carries risk in deeming a person competent. Sources of evidence need to be 'rich' in nature to minimise error in judgment.

Activities associated with normal every day work have a bearing on the decision as to how much and how detailed the data gathered will contribute to its 'richness'. Some skills are more critical to safety and operational requirements while the same skills may be more or less frequently practised. These points are raised for the assessors to consider when choosing an assessment method and developing assessment instruments. Sample assessment instruments are included for Assessors in the Assessment Guidelines of this Training Package.

Critical aspects of evidence required to demonstrate competency in this unit

9.2)

Before the critical aspects of evidence are considered all prerequisites shall be met.

Evidence for competence in this unit shall be considered holistically. Each element and associated performance criteria shall be demonstrated on at least two occasions in accordance with the 'Assessment Guidelines – UEE11'. Evidence shall also comprise:

- A representative body of work performance demonstrated within the timeframes typically expected of the discipline, work function and industrial environment. In particular this

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shall incorporate evidence that shows a candidate is able to:

- Implement Occupational Health and Safety workplace procedures and practices including the use of risk control measures as specified in the performance criteria and range statement
- Apply sustainable energy principles and practices as specified in the performance criteria and range statement
- Demonstrate an understanding of the essential knowledge and associated skills as described in this unit. It may be required by some jurisdictions that RTOs provide a percentile graded result for the purpose of regulatory or licensing requirements.
- Demonstrate an appropriate level of skills enabling employment
- Conduct work observing the relevant Anti Discrimination legislation, regulations, polices and workplace procedures

- Demonstrated consistent performance across a representative range of contexts from the prescribed items below:
  - Conduct mechanical tests on electrical machines as described in 8) and including:

A Dismantling machine and storing parts securely.

B Setting up tests correctly.

C Taking test/measurements reading accurately.

D Determining the status of the machine correctly from test result.

E Documenting the status of the machine clearly.

F Dealing with unplanned events by drawing on essential knowledge and skills to provide appropriate solutions incorporated in the holistic assessment with the above listed items.

Note:

Successful completion of relevant vendor training may be used to contribute to evidence on which competency is deemed. In these cases the alignment of outcomes of vendor training with performance criteria and critical aspects of evidence shall be clearly identified.

Context of and specific resources for assessment

9.3)

This unit should be assessed as it relates to normal work practice

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using procedures, information and resources typical of a workplace. This should include:

OHS policy and work procedures and instructions.

Suitable work environment, facilities, equipment and materials to undertake actual work as prescribed by this unit.

These should be part of the formal learning/assessment environment.

Note:

Where simulation is considered a suitable strategy for assessment, conditions must be authentic and as far as possible reproduce and replicate the workplace and be consistent with the approved industry simulation policy.

The resources used for assessment should reflect current industry practices in relation to conducting mechanical tests on electrical machines.

Method of assessment

9.4)

This unit shall be assessed by methods given in Volume 1, Part 3 'Assessment Guidelines'.

Note:

Competent performance with inherent safe working practices is expected in the industry to which this unit applies. This requires assessment in a structured environment which is primarily intended for learning/assessment and incorporates all necessary equipment and facilities for learners to develop and demonstrate the essential knowledge and skills described in this unit.

Concurrent assessment and relationship with other units

9.5)

For optimisation of training and assessment effort, competency development in this unit may be arranged concurrently with unit:

UEENEEG15 Conduct electrical tests on LV electrical machines 7A

The critical aspects of occupational health and safety covered in unit UEENEEE101A and other discipline specific occupational

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health and safety units shall be incorporated in relation to this unit.

Range Statement

RANGE STATEMENT

10) This relates to the unit as a whole providing the range of contexts and conditions to which the performance criteria apply. It allows for different work environments and situations that will affect performance.

This unit shall be demonstrated in relation to conducting mechanical tests on at least two different electrical mechanical with one of the machines having at least two mechanical faults. The purpose of the tests is to establishing:

- The causes of faults in machines, and
- Whether a machine has been correctly repaired and complies with all requirements

Generic terms used throughout this Vocational Standard shall be regarded as part of the Range Statement in which competency is demonstrated. The definition of these and other terms that apply are given in Volume 2, Part 2.1.

Unit Sector(s)

Not applicable.

Competency Field

Competency Field **11)**

Electrical

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UEENEEG164A Repair and maintain mechanical components of electrical machines

Modification History

Not applicable.

Unit Descriptor

Unit Descriptor **1) Scope:**

1.1) Descriptor

This unit covers the repair and maintain of mechanical components of electrical machines including basic machining. The unit encompasses working safely and to standards, following written instructions and drawing, selecting and setting up machine tools, basic machining, measuring and documenting work activities.

Application of the Unit

Application of the Unit **2)**

This unit is intended for competency development entry-level employment based programs incorporated in approved contracts of training.

Licensing/Regulatory Information

License to practice **3)**

The skills and knowledge described in this unit do not require a license to practice in the workplace. However, practice in this unit is subject to regulations directly related to occupational health and safety and where applicable contracts of training such as apprenticeships.

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Pre-Requisites

Prerequisite Unit(s) **4)**

Competencies **4.1)**

Granting competency in this unit shall be made only after competency in the following unit(s) has/have been confirmed.

UEENEEE101A	Apply Occupational Health and Safety regulations, codes and practices in the workplace
UEENEEE102A	Fabricate, assemble and dismantle utilities industry components
UEENEEE105A	Fix and secure electrotechnology equipment
UEENEEE107A	Use drawings, diagrams, schedules, standards, codes and specifications
UEENEEG111A	Carry out basic repairs to electrical components and equipment

Literacy and numeracy skills **4.2)**

Participants are best equipped to achieve competency in this unit if they have reading, writing and numeracy skills indicated by the following scales. Description of each scale is given in Volume 2, Part 3 ‘Literacy and Numeracy’

Reading 4 Writing 4 Numeracy 4

Employability Skills Information

Employability Skills **5)**

This unit contains Employability Skills

The required outcomes described in this unit of competency contain applicable facets of Employability Skills. The Employability Skills Summary of the

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Employability Skills	**5)** qualification in which this unit of competency is packaged will assist in identifying Employability Skill requirements.

Elements and Performance Criteria Pre-Content

6) Elements describe the essential outcomes of a competency standard unit	Performance Criteria describe the required performance needed to demonstrate achievement of the element. Assessment of performance is to be consistent with the Evidence Guide.

Elements and Performance Criteria

ELEMENT	PERFORMANCE CRITERIA	
1 Prepare to repair component.	1.1	OHS procedures for a given work area are obtained and understood through established routines and procedures.
	1.2	Established OHS risk control measures and procedures in preparation for the work are followed.
	1.3	Safety hazards which have not previously been identified are reported and advise on risk control measures are sought from the work supervisor.
	1.4	The nature of repair work is obtained from documentation or from work supervisor to establish the scope of work to be undertaken.
	1.5	Advice is sought from the work supervisor to ensure the work is coordinated effectively with others.
	1.6	Sources of materials that may be required for the work are established in accordance with established routines and procedures.
	1.7	Tools, equipment and testing devices needed to carry out the work are obtained and checked for correct operation and safety.

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ELEMENT	PERFORMANCE CRITERIA	
	1.8	Appropriate machine is selected, checked for safety and prepared for any necessary machining operation.
	1.9	Cutting tools are selected, sharpened and set up for correctly for each particular machining operation.
2 Repair components.	2.1	Established OHS risk control measures and procedures for carrying out the work are followed.
	2.2	Circuits/machines/plant are checked as being isolated where necessary in strict accordance OHS requirements and procedures.
	2.3	Component being machined is positioned and clamped appropriately.
	2.4	Machining is carried out safely and to suit the component and material being machined.
	2.5	Appropriate measurements are taken to ensure repairs comply with technical standards and job specifications and requirements.
	2.6	Components are repaired to comply with technical standards and job specifications and requirements.
	2.7	Established methods for dealing with unexpected situations are discussed with appropriate person or persons and documented.
	2.8	Unexpected situations are dealt with safely and with the approval of an authorised person.
	2.9	Ongoing checks of the quality of repair work are undertaken in accordance with established procedures.
	2.10	Repairs are carried out efficiently without unnecessary waste of materials and energy and damage to apparatus, circuits, the surrounding environment or services.
3 Complete work and	3.1	OHS work completion risk control measures and

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ELEMENT	PERFORMANCE CRITERIA
report.	procedures are followed.
	3.2 Work area is cleaned and made safe in accordance with established procedures.
	3.3 Fits are made to verify that repaired component conforms to requirements.
	3.4 Work completion is documented and an appropriate person or persons notified in accordance with established procedures.

Required Skills and Knowledge

REQUIRED SKILLS AND KNOWLEDGE

8) This describes the essential skills and knowledge and their level, required for this unit.

Evidence shall show that knowledge has been acquired of safe working practices and repairing and maintaining mechanical components of electrical machines.

All knowledge and skills detailed in this unit should be contextualised to current industry practices and technologies.

KS01-EG164A Electrical machines, mechanical components

Evidence shall show an understanding of repairing mechanical components of electrical machines to an extent indicated by the following aspects:

T1 Dangers and safety precautions

- hazardous dust
- cleaning material
- safe working practices

- T2 Electrical Machine Bearings
  - Types of bearings
  - Bearing clearances
  - Techniques for removing and fitting bearings
  - Handling and storage of bearings
  - Lubrication of bearings
  - Calculation of bearing life
  - Bearing damage and remedial action
- T3 Machines Couplings
  - Types of couplings, applications

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REQUIRED SKILLS AND KNOWLEDGE

- Fitting and aligning couplings
- Types of belts and their applications
- Fittings and aligning pulleys

- T4 Machine
  - components of electrical machines
- T5 Machine faults and testing procedures
  - faults
  - testing
  - inspecting
- T6 Dismantling /assembling and repair procedures
  - marking of electrical connections
  - recording positions of gears/pulleys/couplings
  - dismantle procedures
  - bearing removal/replacement
  - test run
- T7 Brushes
  - characteristics
  - types
  - selection
- T8 Removal and installation
  - marking of winding connections
  - motor alignment
  - alignment procedures

Evidence Guide

EVIDENCE GUIDE

9) The evidence guide provides advice on assessment and must be read in conjunction with the Performance Criteria, Required Skills and Knowledge, the Range Statement and the Assessment Guidelines for this Training Package.

The Evidence Guide forms an integral part of this unit. It must be used in conjunction with all parts of this unit and performed in accordance with the Assessment Guidelines of this Training Package.

Overview of Assessment **9.1)**

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Longitudinal competency development approaches to assessment, such as Profiling, require data to be reliably gathered in a form that can be consistently interpreted over time. This approach is best utilised in Apprenticeship programs and reduces assessment intervention. It is the Industry's preferred model for apprenticeships. However, where summative (or final) assessment is used it is to include the application of the competency in the normal work environment or, at a minimum, the application of the competency in a realistically simulated work environment. It is recognised that, in some circumstances, assessment in part or full can occur outside the workplace. However, it must be in accordance with industry and regulatory policy.

Methods chosen for a particular assessment will be influenced by various factors. These include the extent of the assessment, the most effective locations for the assessment activities to take place, access to physical resources, additional safety measures that may be required and the critical nature of the competencies being assessed.

The critical safety nature of working with electricity, electrical equipment, gas or any other hazardous substance/material carries risk in deeming a person competent. Sources of evidence need to be 'rich' in nature to minimise error in judgment.

Activities associated with normal every day work have a bearing on the decision as to how much and how detailed the data gathered will contribute to its 'richness'. Some skills are more critical to safety and operational requirements while the same skills may be more or less frequently practised. These points are raised for the assessors to consider when choosing an assessment method and developing assessment instruments. Sample assessment instruments are included for Assessors in the Assessment Guidelines of this Training Package.

Critical aspects of evidence required to demonstrate competency in this unit

9.2)

Before the critical aspects of evidence are considered all prerequisites shall be met.

Evidence for competence in this unit shall be considered holistically. Each element and associated performance criteria shall be demonstrated on at least two occasions in accordance with

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the 'Assessment Guidelines – UEE11'. Evidence shall also comprise:

- A representative body of work performance demonstrated within the timeframes typically expected of the discipline, work function and industrial environment. In particular this shall incorporate evidence that shows a candidate is able to:
  - Implement Occupational Health and Safety workplace procedures and practices including the use of risk control measures as specified in the performance criteria and range statement
  - Apply sustainable energy principles and practices as specified in the performance criteria and range statement
  - Demonstrate an understanding of the essential knowledge and associated skills as described in this unit. It may be required by some jurisdictions that RTOs provide a percentile graded result for the purpose of regulatory or licensing requirements.
  - Demonstrate an appropriate level of skills enabling employment
  - Conduct work observing the relevant Anti Discrimination legislation, regulations, polices and workplace procedures
- Demonstrated consistent performance across a representative range of contexts from the prescribed items below:
  - Repair mechanical components of electrical machines as described as described in 8) and including:

A Establishing the nature of the repair work.

B Selecting appropriate method of repair.

C Sharpening cutting tools/twist drills correctly.

D Securing work piece correctly.

E Repairing component to required standard.

F Documenting repairs in accordance with established procedures.

G Dealing with unplanned events by drawing on essential knowledge and skills to provide appropriate solutions incorporated in the holistic assessment with the above listed items.

Note:

Successful completion of relevant vendor training may be used to contribute to evidence on which competency is deemed. In these cases the alignment of outcomes of vendor training with performance criteria and critical aspects of evidence shall be clearly identified

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Context of and specific resources for assessment

9.3)

This unit should be assessed as it relates to normal work practice using procedures, information and resources typical of a workplace. This should include:

OHS policy and work procedures and instructions.

Suitable work environment, facilities, equipment and materials to undertake actual work as prescribed by this unit.

These should be part of the formal learning/assessment environment.

Note:

Where simulation is considered a suitable strategy for assessment, conditions must be authentic and as far as possible reproduce and replicate the workplace and be consistent with the approved industry simulation policy.

The resources used for assessment should reflect current industry practices in relation to repairing mechanical components of electrical machines.

Method of assessment

9.4)

This unit shall be assessed by methods given in Volume 1, Part 3 ‘Assessment Guidelines’.

Note:

Competent performance with inherent safe working practices is expected in the industry to which this unit applies. This requires assessment in a structured environment which is primarily intended for learning/assessment and incorporates all necessary equipment and facilities for learners to develop and demonstrate the essential knowledge and skills described in this unit.

Concurrent assessment and relationship with other units

9.5)

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There are no concurrent assessment recommendations for this unit.

The critical aspects of occupational health and safety covered in unit UEENEEE101A and other discipline specific occupational health and safety units shall be incorporated in relation to this unit.

Range Statement

RANGE STATEMENT

10) This relates to the unit as a whole providing the range of contexts and conditions to which the performance criteria apply. It allows for different work environments and situations that will affect performance.

This unit shall be demonstrated in relation to repairs and maintenance of at least two of the following electrical machine components:

- Shaft
- Bearing housing
- End shield
- Fan
- Coupling
- Machine housing

Generic terms used throughout this Vocational Standard shall be regarded as part of the Range Statement in which competency is demonstrated. The definition of these and other terms that apply are given in Volume 2, Part 2.1.

Unit Sector(s)

Not applicable.

Competency Field

Competency Field **11)**

Electrical

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UEENEEG165A Maintain and service traction lifts systems and equipment

Modification History

Not applicable.

Unit Descriptor

Unit Descriptor **1) Scope:**

1.1) Descriptor

This unit covers maintenance and servicing of traction lift systems and equipment. It encompasses working safely, conducting site cleaning, lubricating and painting lift equipment, inspecting of suspension, governors, compensators, floor selector and tappet switch ropes, and carrying out periodic testing on lift safety gear.

Application of the Unit

Application of the Unit **2)**

This unit applies to any formal recognition for this standard at the aligned AQF 3 level or higher.

Licensing/Regulatory Information

License to practice **3)**

The skills and knowledge described in this unit require a license to practice in the workplace where plant and equipment operate at voltage above 50 V a.c. or 120 V d.c. However other conditions may apply in some jurisdictions subject to regulations related to electrical work. Practice in the workplace and during training is also subject to regulations directly related to occupational health and safety and where applicable contracts of training such as apprenticeships.

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Pre-Requisites

Prerequisite Unit(s) **4)**

Competencies **4.1)**

Granting competency in this unit shall be made only after competency in the following unit(s) has/have been confirmed.

UEENEEE101A	Apply Occupational Health and Safety regulations, codes and practices in the workplace
UEENEEE102A	Fabricate, dismantle, assemble of utilities components
UEENEEE104A	Solve problems in d.c circuits
UEENEEE105A	Fix and secure electrotechnology equipment
UEENEEE107A	Use drawings, diagrams, schedules, standards, codes and specifications
UEENEEG006A	Solve problems in single and three phase low voltage machines
UEENEEG033A	Solve problems in single and three phase electrical apparatus and circuits
UEENEEG063A	Arrange circuits, control and protection for general electrical installations
UEENEEG101A	Solve problems in electromagnetic devices and related circuits
UEENEEG102A	Solve problems in low voltage a.c. circuit
UEENEEG106A	Terminate cables, cords and accessories for low voltage circuits
UEENEEG108A	Trouble-shoot and repair faults in low voltage electrical apparatus and circuits

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Prerequisite Unit(s) **4)**

UEENEEG116A	Diagnose and rectify faults in traction lift systems

Literacy and numeracy skills **4.2)**

Participants are best equipped to achieve competency in this unit if they have reading, writing and numeracy skills indicated by the following scales. Description of each scale is given in Volume 2, Part 3 'Literacy and Numeracy'

Reading 4 Writing 4 Numeracy 4

Employability Skills Information

Employability Skills **5)**

This unit contains Employability Skills

The required outcomes described in this unit of competency contain applicable facets of Employability Skills. The Employability Skills Summary of the qualification in which this unit of competency is packaged will assist in identifying Employability Skill requirements.

Elements and Performance Criteria Pre-Content

6) Elements describe the essential outcomes of a competency standard unit	Performance Criteria describe the required performance needed to demonstrate achievement of the element. Assessment of performance is to be consistent with the Evidence Guide.

Elements and Performance Criteria

ELEMENT	PERFORMANCE CRITERIA

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ELEMENT	PERFORMANCE CRITERIA
1 Prepare to maintain and service lift equipment.	1.1 OHS procedures for a given work area are identified, obtained and understood.
	1.2 OHS risk control measures and procedures in preparation for the work are followed.
	1.3 The likely extend of work to be undertaken is envisaged from maintain procedures or fault/breakdown reports and/or discussions with appropriate person(s).
	1.4 Advice is sought from the work supervisor to ensure the work is coordinated effectively with others.
	1.5 Tools, equipment and testing devices needed to carry out the work are obtained in accordance with established procedures and checked for correct operation and safety.
2 Maintain and service lift equipment.	2.1 OHS risk control measures and procedures for carrying out the work are followed.
	2.2 The need to test or measure live is determined in strict accordance with OHS requirements and when necessary conducted within established safety procedures.
	2.3 Circuits/machines/plant are checked as being isolated where necessary in strict accordance OHS requirements and procedures.
	2.4 Safety hazards resulting from the fault or breakdown are documented and risk control measured and devised and implemented in consultation with appropriate personnel.
3 Completion and report of maintain and servicing activities	3.1 OHS work completion risk control measures and procedures are followed.
	3.2 Reusable, faulty or worn components are tagged and dispatched for repair to maintain adequate spares.
	3.3 Maintenance work activities are documented in accordance with established procedures.

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ELEMENT	PERFORMANCE CRITERIA
	Note. Examples of documentation are components fault reports, test results, authorisations, permits, parts/component dispatch and store records

Required Skills and Knowledge

REQUIRED SKILLS AND KNOWLEDGE

8) This describes the essential skills and knowledge and their level, required for this unit.

Evidence shall show that knowledge has been acquired of safe working practices and maintaining and servicing traction lifts.

All knowledge and skills detailed in this unit should be contextualised to current industry practices and technologies.

KS01-EG165A Lift systems - lift component

Evidence shall show an understanding of the maintenance and servicing of traction lifts to an extent indicated by the following aspects:

T1 Lubricant selection for lift components encompassing:

- Corrosion protection
- Friction reduction
- Cooling
- Viscosity
- Lubricant loss and loss estimation
- Suitable oils, greases, coolants, rust preventatives and solvents for particular devices

T2 Lubricant application for lift components encompassing:

- Hand, Grease guns,
- Oil cans,
- Pressure lubricators,
- Oil misters,
- Level indicators,
- Estimating quantities,
- Lubrication points
- Automatic lubricators

T3 Lift systems single and multiple wrap roping, types of ropes and their attachments encompassing:

- Hoisting

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REQUIRED SKILLS AND KNOWLEDGE

- Governor
- Tappet
- Compensator
- Selector
- Normal lay rope
- Langs lay rope
- Standard ends attachments
- Splices
- Wedge sockets
- Talurit fitting
- Babbit sockets
- Secon fitting

T4 Lift systems basic rope inspection encompassing: Lift systems basic rope inspection encompassing:

- Requirements of Lift Code/enterprise
- Purpose
- Wear
- Broken strands
- Diameter
- Deformation
- Corrosion
- Lubrication
- Tension

T5 Rope stretch encompassing:

- Requirements of Lift Code/enterprise
- Counterweight clearance
- Compensatory equipment

T6 Inspection of rope attachments encompassing:

- Requirements of Lift Code/enterprise
- Rope anchor rods
- Castings, Springs
- Wedges
- Swaging
- Checking for fracturing
- Deformation
- Remedial action

T7 Inspection of sheaves encompassing:

- Groove condition

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REQUIRED SKILLS AND KNOWLEDGE

- Rifling
- Ropes down in sheaves
- Maintenance records

T8 Maintenance, replacement and adjustment of mechanical lift components encompassing:

- Door locks
- Air cords
- Selectors
- Bearings; roller, sleeve, guide shoes, and slipper
- Door guides
- Landing doors
- Car doors
- Tapes/chains
- Motor room equipment
- Well equipment
- Pit equipment

Evidence Guide

EVIDENCE GUIDE

9) The evidence guide provides advice on assessment and must be read in conjunction with the Performance Criteria, Required Skills and Knowledge, the Range Statement and the Assessment Guidelines for this Training Package.

The Evidence Guide forms an integral part of this unit. It must be used in conjunction with all parts of this unit and performed in accordance with the Assessment Guidelines of this Training Package.

Overview of Assessment **9.1)**

Longitudinal competency development approaches to assessment, such as Profiling, require data to be reliably gathered in a form that can be consistently interpreted over time. This approach is best utilised in Apprenticeship programs and reduces assessment intervention. It is the Industry's preferred model for apprenticeships. However, where summative (or final) assessment is used it is to include the application of the competency in the normal work environment or, at a minimum, the application of the

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competency in a realistically simulated work environment. It is recognised that, in some circumstances, assessment in part or full can occur outside the workplace. However, it must be in accordance with industry and regulatory policy.

Methods chosen for a particular assessment will be influenced by various factors. These include the extent of the assessment, the most effective locations for the assessment activities to take place, access to physical resources, additional safety measures that may be required and the critical nature of the competencies being assessed.

The critical safety nature of working with electricity, electrical equipment, gas or any other hazardous substance/material carries risk in deeming a person competent. Sources of evidence need to be 'rich' in nature to minimise error in judgment.

Activities associated with normal every day work have a bearing on the decision as to how much and how detailed the data gathered will contribute to its 'richness'. Some skills are more critical to safety and operational requirements while the same skills may be more or less frequently practised. These points are raised for the assessors to consider when choosing an assessment method and developing assessment instruments. Sample assessment instruments are included for Assessors in the Assessment Guidelines of this Training Package.

Critical aspects of evidence required to demonstrate competency in this unit

9.2)

Before the critical aspects of evidence are considered all prerequisites shall be met.

Evidence for competence in this unit shall be considered holistically. Each element and associated performance criteria shall be demonstrated on at least two occasions in accordance with the 'Assessment Guidelines – UEE11'. Evidence shall also comprise:

- A representative body of work performance demonstrated within the timeframes typically expected of the discipline, work function and industrial environment. In particular this shall incorporate evidence that shows a candidate is able to:
    - Implement Occupational Health and Safety workplace procedures and practices including the use of risk control

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measures as specified in the performance criteria and range statement

- Apply sustainable energy principles and practices as specified in the performance criteria and range statement
- Demonstrate an understanding of the essential knowledge and associated skills as described in this unit. It may be required by some jurisdictions that RTOs provide a percentile graded result for the purpose of regulatory or licensing requirements.
- Demonstrate an appropriate level of skills enabling employment
- Conduct work observing the relevant Anti Discrimination legislation, regulations, polices and workplace procedures

- Demonstrated consistent performance across a representative range of contexts from the prescribed items below:
  - Maintain and service traction lifts as described as described in 8) and including:

A Conduct site cleaning, lubricating and painting of lift equipment.

B Inspect lift ropes.

C Maintain electro-hydraulic lift equipment.

D Carry out lift safety gear periodic testing.

E Dealing with unplanned events by drawing on essential knowledge and skills to provide appropriate solutions incorporated in the holistic assessment with the above listed items.

Note:

Successful completion of relevant vendor training may be used to contribute to evidence on which competency is deemed. In these cases the alignment of outcomes of vendor training with performance criteria and critical aspects of evidence shall be clearly identified

Context of and specific resources for assessment

9.3)

This unit should be assessed as it relates to normal work practice using procedures, information and resources typical of a workplace. This should include:

OHS policy and work procedures and instructions.

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Suitable work environment, facilities, equipment and materials to undertake actual work as prescribed by this unit.

These should be part of the formal learning/assessment environment.

Note:

Where simulation is considered a suitable strategy for assessment, conditions must be authentic and as far as possible reproduce and replicate the workplace and be consistent with the approved industry simulation policy.

The resources used for assessment should reflect current industry practices in relation to maintaining and servicing traction lifts.

Method of assessment

9.4)

This unit shall be assessed by methods given in Volume 1, Part 3 'Assessment Guidelines'.

Note:

Competent performance with inherent safe working practices is expected in the industry to which this unit applies. This requires assessment in a structured environment which is primarily intended for learning/assessment and incorporates all necessary equipment and facilities for learners to develop and demonstrate the essential knowledge and skills described in this unit.

Concurrent assessment and relationship with other units

9.5)

There are no concurrent assessment recommendations for this unit.

Range Statement

RANGE STATEMENT

10) This relates to the unit as a whole providing the range of contexts and conditions to which the performance criteria apply. It allows for different work environments and situations that will affect performance.

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RANGE STATEMENT

- Competency shall be demonstrated in relation to maintaining and servicing at least two of the lift equipment as following:
  - Geared traction drive
  - Gearless traction drive
  - Drum drive
  - Suspended electro-hydraulic drive
- At least two of the roping systems as following:
  - Single or double wrap
  - Single or multiple fall
  - Side slung or underslung
  - Overhead or basement drive
  - Drum drive.
- And at least two of the components as following:
  - Suspension ropes
  - Governor ropes
  - Tappet ropes
  - Compensator ropes
  - Floor selector tapes/ropes
- All safety gear periodic tests as following:
  - Governor type A
  - Governor type B
  - Governor type C

Generic terms used throughout this Vocational Standard shall be regarded as part of the Range Statement in which competency is demonstrated. The definition of these and other terms that apply are given in Volume 2, Part 2.1.

Unit Sector(s)

Not applicable.

Competency Field

Competency Field **11)**

Electrical

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UEENEEG199A Conduct compliance and functional verification of electrical apparatus and existing circuits

Modification History

Not applicable.

Unit Descriptor

Unit Descriptor **1) Scope:**

1.1) Descriptor

This unit covers inspection and testing to verify whether an electrical apparatus and/or existing circuits are safe and complies with all requirements. It encompasses working safely, visual inspections and mandatory, optional and functional testing following verification procedures, identifying non-compliance defects and mandatory reporting requirements.

Application of the Unit

Application of the Unit **2)**

2.1) General Application

This unit applies to all qualifications, competencies and/or Skill Sets which require an unrestricted electrical fitter licence.

Licensing/Regulatory Information

License to practice **3)**

During Training: Competency development activities are subject to regulations directly related to licencing, occupational health and safety and where applicable contracts of training such as apprenticeships.

In the workplace: The application of the skills and knowledge described in this unit require a license to

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License to practice **3)**

practice in the workplace where work is carried out on electrical equipment or existing circuits which are designed to operate at voltages greater than 50 V a.c. or 120 V d.c.

Other conditions may apply under State and Territory legislative and regulatory requirements.

Pre-Requisites

Prerequisite Unit(s) **4)**

Competencies **4.1)**

Granting competency in this unit shall be made only after competency in the following unit(s) has/have been confirmed.

UEENEEE101A	Apply Occupational Health and Safety regulations, codes and practices in the workplace
UEENEEE102A	Fabricate, dismantle and assemble and utilities components
UEENEEE104A	Solve problems in d.c circuits
UEENEEE105A	Fix and secure electrotechnology equipment
UEENEEE107B	Use drawings, diagrams, schedules, standards, codes and specifications
UEENEEE137A	Document and apply measures to control OHS risks associated with electrotechnology work
UEENEEG006A	Solve problems in single and three phase low voltage machines
UEENEEG033A	Solve problems in single and three phase electrical apparatus and circuits
UEENEEG0	Arrange circuits, control and protection for

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Prerequisite Unit(s) **4)**

63A	general electrical installations
UEENEEG101A	Solve problems in electromagnetic devices and related circuits
UEENEEG102A	Solve problems in low voltage a.c. circuits
UEENEEG106A	Terminate cables, cords and accessories for low voltage circuits
UEENEEG108A	Trouble-shoot and repair faults in electrical apparatus and circuits
UEENEEG109A	Develop and connect electrical control circuits

Current Licence Holders:

Those holding an ‘Electrical Fitter Licence’ or equivalent issued in an Australian State or Territory meet the requirements of this unit and its pre-requisite requirements.

Literacy and numeracy skills **4.2)**

Participants are best equipped to achieve competency in this unit if they have reading, writing and numeracy skills indicated by the following scales. Description of each scale is given in Volume 2, Part 3 ‘Literacy and Numeracy’

Reading 5 Writing 5 Numeracy 5

Employability Skills Information

Employability Skills **5)**

The required outcomes described in this unit of competency contain applicable facets of Employability Skills. The Employability Skills Summary of the qualification in which this unit of competency is packaged

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Employability Skills	**5)** will assist in identifying Employability Skill requirements.

Elements and Performance Criteria Pre-Content

6) Elements describe the essential outcomes of a competency standard unit	Performance Criteria describe the required performance needed to demonstrate achievement of the element. Assessment of performance is to be consistent with the Evidence Guide.

Elements and Performance Criteria

ELEMENT	PERFORMANCE CRITERIA
1 Prepare to inspect and test electrical apparatus and existing circuits.	1.1 OHS measures for the site are identified, obtained and understood.
	1.2 Established OHS risk control measures and procedures in preparation for the work are followed
	1.3 Safety hazards, which have not previously been identified, are noted and established risk control measures are implemented.
	1.4 Documentation or deemed to comply standard on which electrical apparatus and existing circuits is based is reviewed and understood.
	1.5 Appropriate personnel are consulted to ensure the work is coordinated effectively with others involved on the work site.
	1.6 Tools, equipment and testing devices needed to verify compliance are obtained in accordance with established procedures and checked for correct operation and safety.
	1.7 Preparatory work is checked to ensure no damage has occurred and complies with

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ELEMENT	PERFORMANCE CRITERIA	
		requirements.
2 Visually inspect and conduct safety testing on electrical apparatus and existing circuits.	2.1	OHS risk control measures and procedures for carrying out the work are followed.
	2.2	The need to test or measure live is determined in strict accordance with OHS requirements and when necessary conducted within established safety procedures.
	2.3	Circuits/machines/plant are checked as being isolated where necessary in strict accordance OHS requirements and following switch-off, lock out and tagging procedures.
	2.4	Knowledge of electrical principles and their application to electrical apparatus and existing circuits is drawn upon in determining whether an electrical apparatus/existing circuits is compliant and functions safely and as intended.
	2.5	Wiring is checked for suitability for the environments in which they are installed and suitably protected from damage or overheating.
	2.6	Protection methods and devices are validated as meeting co-ordination requirements for overload and short-circuit protection.
	2.7	Switchgear and control gear is validated as being appropriately rated and meeting functional requirements.
	2.8	Evidence that electrical equipment complies with safety requirements is cited.
	2.9	Earthing system components are checked that they are correctly located and conductors correctly sized.
	2.12	Mandatory tests are conducted on all connected electrical apparatus and existing circuits to verify that: earthing conductor resistance is sufficiently low; insulation resistance is sufficiently high; all polarities are correct; and circuit connections are

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ELEMENT	PERFORMANCE CRITERIA	
		correct.
	2.12	Testing is conducted to verify that: fault-loop impedance is sufficiently low and residual current devices operates as intended.
3 Report inspection and test findings.	3.1	OHS risk control work completion measures and procedures are followed.
	3.2	Work site is cleaned and made safe in accordance with established procedures.
	3.3	Non-compliance defects are identified and reported in accordance with established procedures.
	3.4	Recommendations for rectifying defects are made in accordance with established procedures.
	3.5	Mandatory documentation is completed in accordance with established procedures.

Required Skills and Knowledge

REQUIRED SKILLS AND KNOWLEDGE

8) This describes the essential skills and knowledge and their level, required for this unit.

Evidence shall show that knowledge has been acquired of safe working practices and verifying compliance and functionality of electrical apparatus and existing circuits.

The knowledge and skills shall be contextualised to current industry standards, technologies and practices.

KS01-EG199A Electrical apparatus and existing circuits — verification and testing

Evidence shall show an understanding of electrical apparatus and existing circuits testing and verification to an extent indicated by the following aspects:

T1 (Is the number correct?)Electrical safety encompassing:

- Safety procedures for working on electrical systems, circuits and apparatus.
- Safe working practices as a normal part of carrying out electrical installation work
- Isolation and lockout procedures

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REQUIRED SKILLS AND KNOWLEDGE

- Tools and equipment needed to conduct electrical work compliance inspection and testing.

T2 Legislated regulations encompassing:

- legislation and regulations that require electrical apparatus and existing circuits to be inspected and tested to ensure they are safe.
- the person/bodies responsible for the various aspects of ensuring electrical apparatus and existing circuits are safe.
- results of tests that show an electrical apparatus and existing circuits is safe for connection to the supply.
- results of periodic inspection and tests that show electrical equipment are safe to use.

T3 Visual inspection of electrical apparatus and existing circuits for compliance with the Wiring Rules encompassing:

- Protection requirements
- General condition
- Wiring systems
- Equipment and accessories
- Earthing

T4 Testing electrical apparatus and existing circuits encompassing:

- tests to ensure: insulation resistance is adequate; earth continuity is such that it will ensure the operation of protection devices under earth fault conditions; polarity of active/s and neutral for final subcircuits is correct; there is no transposition of earthing and neutral conductors; fault-loop impedance is sufficiently low; RCD for correct operation and sensitivity.
- functional tests to ensure active/s and neutral for the same circuit are clearly identified with their circuit protection device.
- tests that show all circuits and devices operate as intended.
- tests to determine the fault level at a particular point in an installation.

T5 Documentation encompassing:

- results of tests conducted on an electrical apparatus and existing circuits comply with requirements and ensure the installation is safe.
- documents of the results of testing electrical apparatus and existing circuits as required by the local supply authority.
- documents of periodic testing and inspection of electrical equipment including tagging requirements.

KS02–EG199A Electrical apparatus and existing circuits — principles and requirements

Evidence shall show an understanding of electrical apparatus and existing circuits principles and requirements to an extent indicated by the following aspects:

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REQUIRED SKILLS AND KNOWLEDGE

T1 (Is the number correct?)Effects of electric current encompassing:

- Physiological effects of current.
- Basic principles by which an electric current can produce heat, light, motion and a chemical reaction.

T2 Single path practical circuit encompassing:

- Arrangement of energy source, protection device, switch and load in a circuit.
- The purpose of each component in the circuit.
- Consequences of an open-circuits, closed-circuits and short-circuits.

T3 Single-source multiple-path d.c. circuits encompassing:

- Circuit configurations and connection.
- Relationship between parameter of voltage, current, resistance power dissipation in the whole or any part of the circuit.
- Safely measuring the parameters for the whole or any part of the circuit.
- Methods of determining circuit behaviour for variation in any of the parameters from measured and calculated values.

T4 Alternating voltage and current generation, phase relationships, energy in an a.c. circuit encompassing:

- Sinusoidal voltage generation and resulting current.
- The terms period; maximum value; peak-to-peak value; instantaneous value; average value; root-mean-square (r.m.s.) value; and frequency.
- Three-phases generation.
- Relationship between the phase voltages generated in a three-phase alternator and the conventions for identifying each.
- Method of determining the phase sequence or phase rotation of a three-phase supply.
- Methods of determining power and energy supplied by three phase circuits.

T5 Fundamental safety principles of the AS/NZS 3000 Part 1 (Section 1) and deemed to comply solution given in Part 2 encompassing:

- Definition of terms
- Fundamental safety principles of protection against direct and indirect contact with live parts; thermal effects; overcurrent; earth faults; abnormal voltages; spread of fire; mechanical injury and external influences.
- Fundamental principles of installation design; selection and installation of equipment; means of compliance (including alterations, additions and repairs) and verification of compliance.

T6 Electric motor selection, starting method and overload protection encompassing:

- Types of motor enclosures suitable for given environmental conditions
- Criteria for selecting motor starters and overload protection.

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REQUIRED SKILLS AND KNOWLEDGE

- Types and connection arrangements for direct-on-line and reduced voltage starters.
- Thermal, magnetic and thermistor overload protection methods.

T7 Ability to apply AS/NZ 3000 requirements for protective and functional earthing encompassing:

- Purpose of protective and functional earthing.
- Parts of the protective earthing systems.
- Earthing arrangements, earthing of equipment and equipotential bonding.
- Methods of determining the maximum fault loop impedance for a circuit.
- Selection of protective conductor and active conductor sizes for each circuit to ensure earth-fault loop impedance is sufficiently low to operate the circuit protective device.

T8 MEN system and its application encompassing:

- The roles of the protective earthing (PE) and neutral (N) conductors in an a consumer's installation and their relationship to the protective earth neutral (PEN) conductor in the electricity distributor's system or sub-main to an outbuilding.
- The importance of the MEN link when a fault occurs.
- The likely consequences of the absence of the MEN link or high impendence in the PEN conductor when a fault occurs.
- The requirements for installation of an MEN link in an installation and an outbuilding.

T9 Knowledge of the application of transformers encompassing:

- Transformers used in distribution and transmission systems and large consumer installations.
- Transformers used in welding machines.
- Applications in appliances
- Risks and safety control measures associated with connection and disconnection of instrument transformers
- Safe working procedures when connecting and testing transformers.
- AS/NZS 3000 requirements and restriction on the installation and use of transformers.

T10 Ability to apply AS/NZ 3000 requirements for protection of circuit against overcurrent and abnormal voltages encompassing:

- Minimum fault levels specified by electricity distributors
- Methods and arrangement for protection against short-circuit currents and overload currents.
- Coordination of overload and short-circuit protection devices.
- Coordination between conductors and overload protection device.
- Causes of over and undervoltage.
- Device and requirements for protection against over and undervoltage.

T11 Additional protection by use of RCDs and use of extra-low voltage for basic

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REQUIRED SKILLS AND KNOWLEDGE

and fault protection encompassing:

- Limitation of an RCD to protect against contact with live parts
- AS/NZS 3000 requirements for use of RCDs.
- Conditions for use of extra-low voltage to provide for basic and fault protection
- AS/NZS 3000 requirements for installation of SELV and PELV systems

T12 Ability to apply AS/NZS 3000 requirements for control and protection of electrical apparatus and existing circuits encompassing:

- Devices for functions of isolation; emergency; Mechanical maintenance and functional control.
- Method for assessing prospective short circuit current.
- Devices and arrangement for protection against overload and short-circuit current.
- Additional protection by RCD
- Protection against switchboard internal arc faults.

T13 Knowledge of AS/NZS 3000 requirements for electrical apparatus and existing circuits in hazardous areas encompassing:

- Types of areas classified as a hazardous area
- Standards to which the maintenance of electrical equipment shall comply.
- Addition training required to work competently with electrical equipment for hazardous areas

T14 Ability to verify compliance of electrical apparatus and existing circuits in accordance with AS/NZS 3000 encompassing:

- Visual inspection to determine whether the electrical apparatus and existing circuits complies with requirements set out in Section 2 to 7 of AS/NZS 3000 and relevant specific installation standards.
- Mandatory tests following guidance given in AS/NZS 3017
- Portable tool safety testing and tagging system in accordance with AS/NZS 3760.

T15 Ability to perform effective safe isolation of any equipment encompassing:

- Preparation of a ‘safe work method statement’ (SWMS) or Job Safety Analysis (JSA) for effective safe isolation.
- Safe methods for identifying source of supply to be isolated.
- Switching-off, lock-out and tagging procedures.
- Safe methods for confirming effective and safe isolation

T16 Ability to apply AS/NZS 3000 requirements to carryout repairs and terminating thermoplastic insulated cables; elastomer sheathed cables; XLPE sheathed cables; and high temperature cables; armoured cables; and neutral screened cables in a wide range of applications.

T17 Ability to perform the circuit tests required for electrical cables in a range of installations and final sub-circuit encompassing:

- Following safe testing procedures.

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REQUIRED SKILLS AND KNOWLEDGE

- Tests to show if the earth continuity and earth-fault loop impedance are sufficiently low.
- Testing to show if insulation resistance is sufficiently high.
- Testing to show if the polarity and circuit connections are correct.

T18 Ability to read, sketch and interpret electrical diagrams encompassing:

- Purpose and characteristics of schematic, block and wiring diagrams, plans and schedules.
- Conventions used in documenting electrical information
- Read and interpret schematic, block and wiring diagrams, plans and schedules
- Sketch electrical diagrams using conventional symbols

T19 Knowledge and understanding occupational safety and health encompassing:

- Basics of Occupational Safety and Health regulations
- Legal responsibilities for employers and employees
- Employers' and employees' own "duty of care".
- Safety committees and their role

T20 Knowledge and understanding of the requirements for personal safety in the workplace encompassing:

- Purpose and use of Safe Work Method Statements (SWMS) or Job Safety Analysis (JSA).
- Purpose and process of reporting OHS incidents.
- Safety procedures for working with electrical circuits and equipment.
- Procedures for safe and effective isolation of electrical supply.
- Regulations for the supervision of apprentices and trainees.

T21 Process in rescuing a person in contact with live electrical conductors or equipment and the primary importance of the safety of the rescuer.

T22 Application of emergency first aid requirements for an electric shock victim encompassing:

- Calling for help.
- Applying cardiopulmonary resuscitation (CPR).
- Selection and use of fire extinguishers to control electrical fire at accident site.

T23 Dangers of high voltage equipment and distribution systems encompassing:

- Step and touch and induced voltages.
- Sources of induced voltage and stored energy
- Creepage and clearance requirements.
- Application of safe working procedures in the vicinity of HV equipment.

T24 Systematic method of commissioning and decommissioning electrical equipment and existing circuits encompassing:

- Commissioning safety procedures

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REQUIRED SKILLS AND KNOWLEDGE

- Circuit voltage testing
- Phase rotation checks
- Functional testing
- Instrument and control parameter settings
- Decommissioning safety procedures.
- Identification of circuits with their control and protection devices.
- Impact of isolation on other parts of an installation.
- Tagging, testing and earthing.
- Safe removal of equipment.

T25 Diagnosing and rectifying faults in electrical apparatus and existing circuits encompassing:

- Faults such as open-circuit; short-circuit; incorrect connections; insulation failure; unsafe condition; apparatus/component failure; related mechanical failure;
- Apparatus such as control devices; fixed appliances/accessories; lighting; electrical machines motors and controls; socket outlets, transformers; protection and metering devices.
- Circuits such as those supplying fixed appliances; lighting; socket outlets; motors and controls circuits; transformers; electronic or computer based equipment.

Evidence Guide

EVIDENCE GUIDE

9) This provides essential advice for assessment of the unit. It must be read in conjunction with the performance criteria and the range statement of the unit and the Training Package Assessment Guidelines.

The Evidence Guide forms an integral part of this unit. It must be used in conjunction with all parts of this unit and performed in accordance with the Assessment Guidelines of this Training Package.

Overview of Assessment **9.1)**

Longitudinal competency development approaches to assessment, such as Profiling, require data to be reliably gathered in a form that can be consistently interpreted over time. This approach is best utilised in Apprenticeship programs and reduces assessment intervention. It is the Industry's preferred model for apprenticeships. However, where summative (or final) assessment is used it is to include the application of the competency in the

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normal work environment or, at a minimum, the application of the competency in a realistically simulated work environment. It is recognised that, in some circumstances, assessment in part or full can occur outside the workplace. However, it must be in accordance with industry and regulatory policy.

Methods chosen for a particular assessment will be influenced by various factors. These include the extent of the assessment, the most effective locations for the assessment activities to take place, access to physical resources, additional safety measures that may be required and the critical nature of the competencies being assessed.

The critical safety nature of working with electricity, electrical equipment, gas or any other hazardous substance/material carries risk in deeming a person competent. Sources of evidence need to be 'rich' in nature to minimise error in judgment.

Activities associated with normal every day work have a bearing on the decision as to how much and how detailed the data gathered will contribute to its 'richness'. Some skills are more critical to safety and operational requirements while the same skills may be more or less frequently practised. These points are raised for the assessors to consider when choosing an assessment method and developing assessment instruments. Sample assessment instruments are included for Assessors in the Assessment Guidelines of this Training Package.

Critical aspects of evidence required to demonstrate competency in this unit

9.2)

Before the critical aspects of evidence are considered all prerequisites shall be met.

Evidence for competence in this unit shall be considered holistically. Each element and associated performance criteria shall be demonstrated on at least two occasions in accordance with the 'Assessment Guidelines – UEE11'. Evidence shall also comprise:

- A representative body of work performance demonstrated within the timeframes typically expected of the discipline, work function and industrial environment. In particular this shall incorporate evidence that shows a candidate is able to:
  - Implement Occupational Health and Safety workplace

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procedures and practices including the use of risk control measures as specified in the performance criteria and range statement

- Apply sustainable energy principles and practices as specified in the performance criteria and range statement
- Demonstrate an understanding of the essential knowledge and associated skills as described in this unit. It may be required by some jurisdictions that RTOs provide a percentile graded result for the purpose of regulatory or licensing requirements.
- Demonstrate an appropriate level of skills enabling employment
- Conduct work observing the relevant Anti Discrimination legislation, regulations, polices and workplace procedures

- Demonstrated consistent performance across a representative range of contexts from the prescribed items below:
  - Verify compliance and functionality of general electrical apparatus and existing circuit installations as described as described in 8) and including:

A Selecting correct tools and testing equipment.

B Identifying visual non-compliance defects.

C Using effective methods for conducting mandatory and optional tests.

D Identifying non-compliance and functional defects from test results.

E Identifying causes of non-compliance and functional defects.

F Completing mandatory reporting.

G Dealing with unplanned events

Context of and specific resources for assessment

9.3)

This unit should be assessed as it relates to normal work practice using procedures, information and resources typical of a workplace. This should include:

OHS policy and work procedures and instructions.

Suitable work environment, facilities, equipment and materials to undertake actual work as prescribed by this unit.

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These should be part of the formal learning/assessment environment.

Note:

Where simulation is considered a suitable strategy for assessment, conditions must be authentic and as far as possible reproduce and replicate the workplace and be consistent with the approved industry simulation policy.

The resources used for assessment should reflect current industry practices in relation to verifying compliance and functionality of electrical apparatus and existing circuits.

Method of assessment

9.4)

This unit shall be assessed by methods given in Volume 1, Part 3 'Assessment Guidelines'.

Note:

Competent performance with inherent safe working practices is expected in the industry to which this unit applies. This requires assessment in a structured environment which is primarily intended for learning/assessment and incorporates all necessary equipment and facilities for learners to develop and demonstrate the essential knowledge and skills described in this unit.

Concurrent assessment and relationship with other units

9.5)

There are no concurrent assessment recommendations for this unit.

Range Statement

RANGE STATEMENT

10) This relates to the unit as a whole providing the range of contexts and conditions to which the performance criteria apply. It allows for different work environments and situations that will affect performance.

This unit shall be demonstrated in relation to verification and testing for at least two types of installations containing electrical apparatus and existing circuits comprising

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RANGE STATEMENT

an apparatus and existing circuit supplied by a single phase supply. The other installations shall include apparatus and existing circuits supplied by a three phase supply.

Unit Sector(s)

Not applicable.

Competency Field

Competency Field **11)**

Electrical

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UEENEEH102A Repairs basic electronic apparatus faults by replacement of components

Modification History

Not applicable.

Unit Descriptor

Unit Descriptor **1) Scope:**

1.1) Descriptor

This unit deals the replacement of electronic components, cabling and sub systems of electronic apparatus. It encompasses safe working practices, following written and oral instruction and procedures, basic testing and techniques, dismantling and assembling apparatus and disconnecting and reconnecting components.

Application of the Unit

Application of the Unit **2)**

This unit may apply to persons entering work in electro technology and may be used in school based vocational programs.

Licensing/Regulatory Information

License to practice **3)**

The skills and knowledge described in this unit do not require a license to practice in the workplace provided equipment is not connected to installation wiring at voltage above 50 V a.c. or 120 V d.c. However, practice in this unit is subject to regulations directly related to occupational health and safety and where applicable contracts of training such as apprenticeships.

Note:

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License to practice **3)**

1. Compliance with permits may be required in various jurisdictions and typically relates to the operation of plant, machinery and equipment such as elevating work platforms, powder operated fixing tools, power operated tools, vehicles, road signage and traffic control, lifting equipment and the like. Permits may also be required for some work environments such as confined spaces, working aloft, near live electrical apparatus and site rehabilitation.

2. Compliance may be required in various jurisdictions relating to currency in First Aid, confined space, lifting and risk safety measures

Pre-Requisites

Prerequisite Unit(s) **4)**

Competencies **4.1)**

Granting competency in this unit shall be made only after competency in the following unit(s) has/have been confirmed.

UEENEEE101A	Apply Occupational Health and Safety regulations, codes and practices in the workplace
UEENEEE102A	Fabricate, dismantle, assemble of utilities industry components

Literacy and numeracy skills **4.2)**

Participants are best equipped to achieve competency in this unit if they have reading, writing and numeracy skills indicated by the following scales. Description of each scale is given in Volume 2, Part 3 ‘Literacy and Numeracy’

Reading 3 Writing 3 Numeracy 3

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Employability Skills Information

Employability Skills **5)**

This unit contains Employability Skills

The required outcomes described in this unit of competency contain applicable facets of Employability Skills. The Employability Skills Summary of the qualification in which this unit of competency is packaged will assist in identifying Employability Skill requirements.

Elements and Performance Criteria Pre-Content

6) Elements describe the essential outcomes of a competency standard unit

Performance Criteria describe the required performance needed to demonstrate achievement of the element. Assessment of performance is to be consistent with the Evidence Guide.

Elements and Performance Criteria

ELEMENT		PERFORMANCE CRITERIA	
1	Prepare to repair electronic apparatus.	1.1	OHS procedures for a given work area are identified, obtained and understood through established routines and procedures.
		1.2	Established OHS risk control measures and procedures are followed in preparation for the work.
		1.3	The nature of the repair is obtained from documentation or from work supervisor to establish the scope of work to be undertaken.
		1.4	Advice is sought from the work supervisor to ensure the work is co-ordinated effectively with others.
		1.5	Sources of materials that may be required for the work are established in accordance with established routines and procedures.
		1.6	Tools, apparatus and testing devices needed

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ELEMENT	PERFORMANCE CRITERIA	
		to carry out the work are obtained and checked for correct operation and safety.
2 Repair electronic apparatus.	2.1	Established OHS risk control measures and procedures for carrying out the work are followed.
	2.2	The need to test or measure live is determined in strict accordance with OHS requirements and when necessary conducted within established safety procedures.
	2.3	Circuits/apparatus are checked as being isolated where necessary in strict accordance OHS requirements and procedures.
	2.4	Apparatus is dismantled in accordance with manufacturer's guide and supervisor's instructions.
	2.5	Component parts are tagged during the dismantling to help ensure correct and efficient reassembly and stored to protect them against loss or damage.
	2.6	Repairs are affected efficiently without damage to other components, apparatus or circuits.
	2.7	Apparatus is assembled in an appropriate sequence with all components parts placed, secured and connected in accordance with manufacturer's guide or industry practice.
	2.8	Procedures for referring non-routine events to immediate supervisor for directions are followed.
	2.9	Repairs are carried out efficiently without waste of materials or damage to apparatus and the surrounding environment or services and using sustainable energy practices.
3 Complete and report repair work activities.	3.1	OHS work completion risk control measures and procedures are followed.
	3.2	Repaired apparatus is prepared and forwarded to appropriate person(s) for

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ELEMENT	PERFORMANCE CRITERIA
	testing.
	3.3 Work area is cleaned and made safe in accordance with established procedures.
	3.4 Work supervisor is notified of the completion of the repair work in accordance with established procedures.

Required Skills and Knowledge

REQUIRED SKILLS AND KNOWLEDGE

8) This describes the essential skills and knowledge and their level, required for this unit.

Evidence shall show that knowledge has been acquired of safe working practices and carrying out basic repairs to electronic apparatus by replacement of components.

All knowledge and skills detailed in this unit should be contextualised to current industry practices and technologies.

KS01-EH102A Component replacement to repair basic electronic apparatus faults

Evidence shall show an understanding of component replacement to repair basic electronic apparatus faults, applying safe working practices and relevant Standards, Codes and Regulations to an extent indicated by the following aspects:

T1. Electronic soldering equipment and techniques

- Workshop hazards and safety associated with soldering
- Quality concepts
- Electronic soldering equipment
- The soldering process
- Lead free solder

T2. Printed circuit board soldering techniques

- Electronic component mounting
- Solder rework of printed circuit boards.
- Faulty solder joints

T3. Soldering electronic cables

- Soldering multi-strand, ribbon and coaxial cables
- Effects and prevention of electrostatic discharge (ESD)

T4. Electronic component basics

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REQUIRED SKILLS AND KNOWLEDGE

- Types of components
- The physical features and primary characteristic of components
- Marking and codes on components
- Handling static sensitive components

T5. Electronic cable overview and coaxial cable

- Coaxial cables types and characteristics
- Coaxial cable termination

T6. Performance copper cables

- Twisted pair voice and data cables
- Insulation displacement (IDC) termination
- Colour codes
- Terminating performance cables
- Harness wiring

T7. Electronic apparatus components

- Fault finding
- Testing
- Replacement

Evidence Guide

EVIDENCE GUIDE

9) The evidence guide provides advice on assessment and must be read in conjunction with the Performance Criteria, Required Skills and Knowledge, the Range Statement and the Assessment Guidelines for this Training Package. .

The Evidence Guide forms an integral part of this unit. It must be used in conjunction with all parts of the unit and performed in accordance with the Assessment Guidelines of this Training Package.

Overview of Assessment	**9.1)**
	Longitudinal competency development approaches to assessment, such as Profiling, require data to be reliably gathered in a form that can be consistently interpreted over time. This approach is best utilised in Apprenticeship programs and reduces assessment intervention. It is the Industry-preferred model for apprenticeships. However, where summative (or final) assessment is used it must

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include the application of the competency in the normal work environment or, at a minimum, the application of the competency in a realistically simulated work environment. It is recognised that, in some circumstances, assessment in part or full can occur outside the workplace. However, it must be in accord with industry and regulatory policy.

Methods chosen for a particular assessment will be influenced by various factors. These include the extent of the assessment, the most effective locations for the assessment activities to take place, access to physical resources, additional safety measures that may be required and the critical nature of the competencies being assessed.

The critical safety nature of working with electricity, electrical equipment, gas or any other hazardous substance/material carries risk in deeming a person competent. Sources of evidence need to be 'rich' in nature to minimise error in judgment.

Activities associated with normal everyday work influence decisions about how/how much the data gathered will contribute to its 'richness'. Some skills are more critical to safety and operational requirements while the same skills may be more or less frequently practised. These points are raised for the assessors to consider when choosing an assessment method and developing assessment instruments. Sample assessment instruments are included for Assessors in the Assessment Guidelines of this Training Package.

Critical aspects of evidence required to demonstrate competency in this unit

9.2)

Before the critical aspects of evidence are considered all prerequisites shall be met.

Evidence for competence in this unit shall be considered holistically. Each Element and associated performance criteria shall be demonstrated on at least two occasions in accordance with the 'Assessment Guidelines – UEE11'. Evidence shall also comprise:

- A representative body of work performance demonstrated within the timeframes typically expected of the discipline, work function and industrial environment. In particular this shall incorporate evidence that shows a candidate is able to:

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- Implement Occupational Health and Safety workplace procedures and practices, including the use of risk control measures as specified in the performance criteria and range statement
- Apply sustainable energy principles and practices as specified in the performance criteria and range statement
- Demonstrate an understanding of the essential knowledge and associated skills as described in this unit. It may be required by some jurisdictions that RTOs provide a percentile graded result for the purpose of regulatory or licensing requirements.
- Demonstrate an appropriate level of skills enabling employment
- Conduct work observing the relevant Anti Discrimination legislation, regulations, polices and workplace procedures

- Demonstrated consistent performance across a representative range of contexts from the prescribed items below:
  - Carry out basic repairs to electronic apparatus by replacement of components as described in 8) and including:

A Following manufacturer service instructions for access to components.

B Removing at least three different types of components specified in the work instructions.

C Replacing components to manufacturer requirements.

D Terminating correctly electronic cables using solderless termination techniques

E De-soldering and soldering to a high reliability standard and without damage to components.

F Reassembling the apparatus correctly.

G Testing apparatus operation.

H Dealing with unplanned events by drawing on essential knowledge and skills to provide appropriate solutions incorporated in a holistic assessment with the above listed items.

Note:

Successful completion of relevant vendor training may be used to contribute to evidence on which competency is deemed. In these cases the alignment of outcomes of vendor training with performance criteria and critical aspects of evidence shall be clearly identified.

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Context of and specific resources for assessment **9.3)**

This unit should be assessed as it relates to normal work practice using procedures, information and resources typical of a workplace. This should include:

- OHS policy and work procedures and instructions.
- Suitable work environment, facilities, equipment and materials to undertake actual work as prescribed by this unit.

These should be part of the formal learning/assessment environment.

Note: Where simulation is considered a suitable strategy for assessment, conditions must be authentic and as far as possible reproduce and replicate the workplace and be consistent with the approved industry simulation policy.

The resources used for assessment should reflect current industry practices in relation to carrying out basic repairs to electronic apparatus by replacement of components.

Method of assessment **9.4)**

This unit shall be assessed by methods given in Volume 1, Part 3 'Assessment Guidelines'.

Note: Competent performance with inherent safe working practices is expected in the industry to which this unit applies. This requires that the specified essential knowledge and associated skills are assessed in a structured environment which is primarily intended for learning/assessment and incorporates all necessary equipment and facilities for learners to develop and demonstrate the essential knowledge and skills described in this unit.

Concurrent assessment and relationship with other units **9.5)**

For optimisation of training and assessment effort, competency development in this unit may be arranged concurrently with unit:

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UEENEEE102A	Fabricate, dismantle, assemble of utilities industry components

Range Statement

RANGE STATEMENT

10) This relates to the unit as a whole providing the range of contexts and conditions to which the performance criteria apply. It allows for different work environments and situations that will affect performance.

This unit shall be demonstrated in relation to carrying out basic repairs electronic apparatus limited to replacement or repair of components, including sub systems in which the fault has been previously established.

At least two of the repairs shall require soldering and desoldering and at least two of the repairs shall require a cable to be correctly terminated using a solderless termination technique.

Generic terms used throughout this Vocational Standard shall be regarded as part of the Range Statement in which competency is demonstrated. The definition of these and other terms that apply are given in Volume 2, Part 2.1.

Unit Sector(s)

Not applicable.

Competency Field

Competency Field **11)**

Electronics

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UEENEEH111A Troubleshoot single phase input d.c. power supplies

Modification History

Release	Action	Core/Elective	Details	Points
3	Update		Correct Prerequisite title UEENEEH114A - Troubleshoot resonance circuits in an electronic apparatus	

Unit Descriptor

Unit Descriptor **1) Scope:**

1.1) Descriptor

This unit covers determining correct operation of independent power supplies and power supply sections of electronic apparatus. It encompasses working safely, problem solving procedures, including the use of voltage, current and resistance measuring devices, providing solutions derived from measurements and calculations to predictable problems in d.c. power supplies with single phases input.

Application of the Unit

Application of the Unit **2)**

This competency standard unit is intended for development of competency in either entry-level employment based programs incorporated in approved contracts of training or other approved training programs. It may also be used to augment formally acquired competencies.

This unit is intended to apply to any recognised development program that leads to the acquisition of a formal award at AQF level 3 or higher.

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Licensing/Regulatory Information

License to practice **3)**

The skills and knowledge described in this unit do not require a license to practice in the workplace provided equipment is not connected to installation wiring at voltage above 50 V a.c. or 120 V d.c. However other conditions may apply in some States/Territories subject to regulations related to electrical work.

Practice in the workplace and during training is also subject to regulations directly related to occupational health and safety and where applicable contracts of training such as apprenticeships.

Note:

1. Compliance with permits may be required in various jurisdictions and typically relates to the operation of plant, machinery and equipment such as elevating work platforms, powder operated fixing tools, power operated tools, vehicles, road signage and traffic control, lifting equipment and the like. Permits may also be required for some work environments such as confined spaces, working aloft, near live electrical apparatus and site rehabilitation.

2. Compliance may be required in various jurisdictions relating to currency in First Aid, confined space, lifting and risk safety measures.

Pre-Requisites

Prerequisite Unit(s) **4)**

Competencies **4.1)**

Granting competency in this unit shall be made only after competency in the following unit(s) has/have been confirmed.

UEENEEE101A	Apply Occupational Health and Safety regulations, codes and practices in the workplace

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Prerequisite Unit(s) **4)**

UEENEEE104A	Solve problems in d.c. circuits
UEENEEH102A	Repair basic electronic apparatus faults by replacement of components
AND	
UEENEEH114A	Troubleshoot resonance circuits in an electronic apparatus
OR	
UEENEEE119A	Solve problems in multiple path extra low voltage (ELV) a.c. circuits
OR	
UEENEEH169A	Solve problems in basic electronic circuits
OR	
UEENEEG101A	Solve problems in electromagnetic devices and related circuits
UEENEEG102A	Solve problems in low voltage a.c. circuits

Literacy and numeracy skills **4.2)**

Participants are best equipped to achieve competency in this unit if they have reading, writing and numeracy skills indicated by the following scales. Description of each scale is given in Volume 2, Part 3 ‘Literacy and Numeracy’.

Reading	3	Writing	3	Numeracy	3

Employability Skills Information

Employability Skills **5)**

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Employability Skills **5)**

This unit contains Employability Skills

The required outcomes described in this unit of competency contain applicable facets of Employability Skills. The Employability Skills Summary of the qualification in which this unit of competency is packaged will assist in identifying Employability Skill requirements.

Elements and Performance Criteria Pre-Content

6) Elements describe the essential outcomes of a competency standard unit

Performance Criteria describe the required performance needed to demonstrate achievement of the element. Assessment of performance is to be consistent with the Evidence Guide.

Elements and Performance Criteria

ELEMENT	PERFORMANCE CRITERIA
1 Prepare to troubleshoot d.c. power supplies.	1.1 OHS procedures for a given work area are obtained and understood.
	1.2 OHS risk control work preparation measures and procedures are followed.
	1.3 The nature of the fault is obtained from documentation or from work supervisor to establish the scope of work to be undertaken.
	1.4 Advice is sought from the work supervisor to ensure the work is co-ordinated effectively with others.
	1.5 Sources of materials that may be required for the work are established in accordance with established procedures.
	1.6 Tools, equipment and testing devices needed to carry out the work are obtained and checked for correct operation and safety.
2 Solve d.c. power	2.1 OHS risk control work measures and procedures

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ELEMENT	PERFORMANCE CRITERIA	
supply problems.		are followed.
	2.2	The need to test or measure live is determined in strict accordance with OHS requirements and when necessary conducted within established safety procedures.
	2.3	Circuits are checked as being isolated where necessary in strict accordance OHS requirements and procedures.
	2.4	Fault finding is approached methodically drawing on knowledge of dc power supplies using measured and calculated values of parameters.
	2.5	Unexpected situations are dealt with safely and with the approval of an authorised person.
	2.6	Fault finding activities are carried out efficiently without unnecessary waste of materials or damage to apparatus and the surrounding environment or services and using sustainable energy practices.
3 Complete work and document problem solving activities.	3.1	OHS work completion risk control measures and procedures are followed.
	3.2	Work site is cleaned and made safe in accordance with established procedures.
	3.3	Justification for solutions used to troubleshooting problems is documented.
	3.4	Work completion is documented and an appropriate person or persons notified in accordance with established procedures.

Required Skills and Knowledge

REQUIRED SKILLS AND KNOWLEDGE

8) This describes the essential skills and knowledge and their level, required for this unit.

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REQUIRED SKILLS AND KNOWLEDGE

Evidence shall show that knowledge has been acquired of safe working practices and troubleshooting d.c. power supplies with single phase input.

All knowledge and skills detailed in this unit should be contextualised to current industry practices and technologies..

KS01-EH111A Single phase input d.c. power supplies

Evidence shall show an understanding of single phase input d.c. power supplies , applying safe working practices and relevant Standards, Codes and Regulations to an extent indicated by the following aspects

T1. power supplies operating principles and applications

- Power supply function
- Block diagram identifying each sub-system
- Expected waveforms in a power supply
- Constant Voltage
- Constant Current

T2. D.C. rectification circuits

- Junction diode characteristics
- Transformer turns ratio and losses
- Half wave and full wave rectifiers
- Dual rail supply

T3. Filter circuits

- Capacitive and inductive filters
- Ripple

T4. Zener diode regulator

- Zener shunt regulator circuit
- Load and line regulation definitions
- Operating parameters and data sheets

T5. Three terminal regulator circuits

- Need for regulation
- Three terminal regulator characteristics
- Short circuit protection
- Line and load regulation
- Regulated power efficiency
- Remote voltage sensing

T6. Electronic testing and measuring devices and techniques

- Test/measuring devices and their application - analogue and digital multimeters, voltage and digital testers, signal generators and oscilloscopes
- Connection of test/measuring devices into a circuit encompassing:

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REQUIRED SKILLS AND KNOWLEDGE

- safety procedures
- circuit arrangement of test/measuring devices
- Taking readings
- Storage, maintenance and care of test/measuring devices

T7. D.C. power supply testing and fault finding

- Rectifier diode faults
- Zener diode faults
- Three terminal regulator faults

T8. OH&S

- Apply safe working practices and relevant Standards, Codes and Regulations

Evidence Guide

EVIDENCE GUIDE

9) The evidence guide provides advice on assessment and must be read in conjunction with the Performance Criteria, Required Skills and Knowledge, the Range Statement and the Assessment Guidelines for this Training Package.

The Evidence Guide forms an integral part of this unit. It must be used in conjunction with all parts of the unit and performed in accordance with the Assessment Guidelines of this Training Package.

Overview of Assessment **9.1)**

Longitudinal competency development approaches to assessment, such as Profiling, require data to be reliably gathered in a form that can be consistently interpreted over time. This approach is best utilised in Apprenticeship programs and reduces assessment intervention. It is the Industry-preferred model for apprenticeships. However, where summative (or final) assessment is used it must include the application of the competency in the normal work environment or, at a minimum, the application of the competency in a realistically simulated work environment. It is recognised that, in some circumstances, assessment in part or full can occur outside the workplace. However, it must be in accord with industry and regulatory policy.

Methods chosen for a particular assessment will be influenced by various factors. These include the extent of the assessment, the

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most effective locations for the assessment activities to take place, access to physical resources, additional safety measures that may be required and the critical nature of the competencies being assessed.

The critical safety nature of working with electricity, electrical equipment, gas or any other hazardous substance/material carries risk in deeming a person competent. Sources of evidence need to be 'rich' in nature to minimise error in judgment.

Activities associated with normal everyday work influence decisions about how/how much the data gathered will contribute to its 'richness'. Some skills are more critical to safety and operational requirements while the same skills may be more or less frequently practised. These points are raised for the assessors to consider when choosing an assessment method and developing assessment instruments. Sample assessment instruments are included for Assessors in the Assessment Guidelines of this Training Package.

Critical aspects of evidence required to demonstrate competency in this unit

9.2)

Before the critical aspects of evidence are considered all prerequisites shall be met.

Evidence for competence in this unit shall be considered holistically. Each Element and associated performance criteria shall be demonstrated on at least two occasions in accordance with the 'Assessment Guidelines – UEE11'. Evidence shall also comprise:

- A representative body of work performance demonstrated within the timeframes typically expected of the discipline, work function and industrial environment. In particular this shall incorporate evidence that shows a candidate is able to:
  - Implement Occupational Health and Safety workplace procedures and practices, including the use of risk control measures as specified in the performance criteria and range statement
  - Apply sustainable energy principles and practices as specified in the performance criteria and range statement
  - Demonstrate an understanding of the essential knowledge and associated skills as described in this unit. It may be

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required by some jurisdictions that RTOs provide a percentile graded result for the purpose of regulatory or licensing requirements.

- Demonstrate an appropriate level of skills enabling employment
- Conduct work observing the relevant Anti Discrimination legislation, regulations, polices and workplace procedures

- Demonstrated consistent performance across a representative range of contexts from the prescribed items below:
  - Troubleshoot d.c. power supplies with single phase input as described in 8) and including:

A Using methodical problem solving methods.

B Taking measurements correctly and accurately.

C Calculating parameters correctly and accurately.

D Providing solution to power supply problems, and

E Providing written justification for the solutions to problems.

F Dealing with unplanned events by drawing on essential knowledge and skills to provide appropriate solutions incorporated in a holistic assessment with the above listed items.

Note:
Successful completion of relevant vendor training may be used to contribute to evidence on which competency is deemed. In these cases the alignment of outcomes of vendor training with performance criteria and critical aspects of evidence shall be clearly identified.

Context of and specific resources for assessment

9.3)

This unit should be assessed as it relates to normal work practice using procedures, information and resources typical of a workplace. This should include:

- OHS policy and work procedures and instructions.
- Suitable work environment, facilities, equipment and materials to undertake actual work as prescribed by this unit.

These should be part of the formal learning/assessment environment.

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Note:

Where simulation is considered a suitable strategy for assessment, conditions must be authentic and as far as possible reproduce and replicate the workplace and be consistent with the approved industry simulation policy.

The resources used for assessment should reflect current industry practices in relation to troubleshooting d.c. power supplies with single phase input.

Method of assessment

9.4)

This unit shall be assessed by methods given in Volume 1, Part 3 'Assessment Guidelines'.

Note:
Competent performance with inherent safe working practices is expected in the industry to which this unit applies. This requires that the specified essential knowledge and associated skills are assessed in a structured environment which is primarily intended for learning/assessment and incorporates all necessary equipment and facilities for learners to develop and demonstrate the essential knowledge and skills described in this unit.

Concurrent assessment and relationship with other units

9.5)

There are no concurrent assessment recommendations for this unit.

The critical aspects of occupational health and safety covered in unit UEENEEE101A and other discipline specific occupational health and safety units shall be incorporated in relation to this unit.

Range Statement

RANGE STATEMENT

10) This relates to the unit as a whole providing the range of contexts and conditions to which the performance criteria apply. It allows for different work environments and situations that will affect performance.

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RANGE STATEMENT

This unit shall be demonstrated in relation to troubleshooting d.c. power supplies with single phase input on the rectification section and filtering section of a half wave bridge rectifier and a full wave bridge rectifier.

Generic terms used throughout this Vocational Standard shall be regarded as part of the Range Statement in which competency is demonstrated. The definition of these and other terms that apply are given in Volume 2, Part 2.1.

Unit Sector(s)

Not applicable.

Competency Field

Competency Field **11)**

Electronics

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UEENEEH114A Troubleshoot resonance circuits in an electronic apparatus

Modification History

Not applicable.

Unit Descriptor

Unit Descriptor **1) Scope:**

1.1) Descriptor

This unit covers determining correct operation of resonance circuits used in electronic apparatus. It encompasses working safely, problem solving procedures, including the use of voltage, current and resistance measuring devices, providing solutions derived from measurements and calculations to predictable problems in resonance circuits.

Application of the Unit

Application of the Unit **2)**

This competency standard unit is intended for development of competency in either entry-level employment based programs incorporated in approved contracts of training or other approved training programs. It may also be used to augment formally acquired competencies.

This unit is intended to apply to any recognised development program that leads to the acquisition of a formal award at AQF level 3 or higher.

Licensing/Regulatory Information

License to practice **3)**

The skills and knowledge described in this unit do not

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License to practice **3)**

require a license to practice in the workplace provided equipment is not connected to installation wiring at voltage above 50 V a.c. or 120 V d.c. However other conditions may apply in some States/Territories subject to regulations related to electrical work.

Practice in the workplace and during training is also subject to regulations directly related to occupational health and safety and where applicable contracts of training such as apprenticeships.

Note:

1. Compliance with permits may be required in various jurisdictions and typically relates to the operation of plant, machinery and equipment such as elevating work platforms, powder operated fixing tools, power operated tools, vehicles, road signage and traffic control, lifting equipment and the like. Permits may also be required for some work environments such as confined spaces, working aloft, near live electrical apparatus and site rehabilitation.

2. Compliance may be required in various jurisdictions relating to currency in First Aid, confined space, lifting and risk safety measures.

Pre-Requisites

Prerequisite Unit(s) **4)**

Competencies **4.1)**

Granting competency in this unit shall be made only after competency in the following unit(s) has/have been confirmed.

UEENEEE101A	Apply Occupational Health and Safety regulations, codes and practices in the workplace

AND

UEENEEE104A	Solve problems in d.c. circuits

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Prerequisite Unit(s) **4)**

OR

UEENEEH1 Solve problems in basic electronic circuits 69A

For the full prerequisite chain details for this unit please refer to Table 2 in Volume 1, Part 2

Literacy and numeracy skills **4.2)**

Participants are best equipped to achieve competency in this unit if they have reading, writing and numeracy skills indicated by the following scales. Description of each scale is given in Volume 2, Part 3 'Literacy and Numeracy'

Reading 3 Writing 3 Numeracy 3

Employability Skills Information

Employability Skills **5)**

This unit contains Employability Skills

The required outcomes described in this unit of competency contain applicable facets of Employability Skills. The Employability Skills Summary of the qualification in which this unit of competency is packaged will assist in identifying Employability Skill requirements.

Elements and Performance Criteria Pre-Content

6) Elements describe the essential outcomes of a competency standard unit

Performance Criteria describe the required performance needed to demonstrate achievement of the element. Assessment of performance is to be consistent with the Evidence Guide.

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Elements and Performance Criteria

ELEMENT	PERFORMANCE CRITERIA
1 Prepare to troubleshoot resonance circuits.	1.1 OHS procedures for a given work area are obtained and understood.
	1.2 OHS risk control work preparation measures and procedures are followed.
	1.3 The nature of the fault is obtained from documentation or from work supervisor to establish the scope of work to be undertaken.
	1.4 Advice is sought from the work supervisor to ensure the work is co-ordinated effectively with others.
	1.5 Sources of materials that may be required for the work are established in accordance with established procedures.
	1.6 Tools, equipment and testing devices needed to carry out the work are obtained and checked for correct operation and safety.
2 Solve in resonance circuits.	2.1 OHS risk control work measures and procedures are followed.
	2.2 The need to test or measure live is determined in strict accordance with OHS requirements and when necessary conducted within established safety procedures.
	2.3 Circuits are checked as being isolated where necessary in strict accordance OHS requirements and procedures.
	2.4 Fault finding is approached methodically drawing on knowledge of resonance circuits using measured and calculated values of parameters.
	2.5 Unexpected situations are dealt with safely and with the approval of an authorised person.
	2.6 Fault finding activities are carried out efficiently without unnecessary waste of materials or damage to apparatus and the surrounding environment or services and using sustainable

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ELEMENT	PERFORMANCE CRITERIA	
		energy practices.
3 Complete work and document troubleshooting activities.	3.1	OHS work completion risk control measures and procedures are followed.
	3.2	Work site is cleaned and made safe in accordance with established procedures.
	3.3	Justification for solutions used to troubleshooting problems is documented.
	3.4	Work completion is documented and an appropriate person or persons notified in accordance with established procedures.

Required Skills and Knowledge

REQUIRED SKILLS AND KNOWLEDGE

8) This describes the essential skills and knowledge and their level, required for this unit.

Evidence shall show that knowledge has been acquired of safe working practices and troubleshooting frequency dependent circuits.

All knowledge and skills detailed in this unit should be contextualised to current industry practices and technologies.

KS01-EH114A Resonance circuits troubleshooting

Evidence shall show an understanding of resonance circuit troubleshooting, applying safe working practices and relevant Standards, Codes and Regulations to an extent indicated by the following aspects:

T1. Basic engineering mathematics

- SI Units
- Using a calculator.
- Basic Algebra
- Applying the laws of indices.
- Simplification of expressions involving square roots.
- Graphs and tables.
- Pythagoras' Theorem and trigonometry ratios.

T2. Sinusoidal alternating voltage and current

- Generating a sinusoidal waveform
- Definition of the terms period, peak, peak-to-peak, instantaneous, average, and

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REQUIRED SKILLS AND KNOWLEDGE

root-mean-square value
- Calculating the instantaneous value of a sinusoidal waveform
- Calculating the root-mean-square value and frequency of a of a sinusoidal waveform
- Phase relationship between two or more sinusoidal waveforms
- Common waveforms used in electronic circuitry
- Observation of sinusoidal and other waveforms

T3. A.C. measuring equipment

- Operating principles of a cathode ray oscilloscope (CRO)
- Set up, calibration and use of a CRO
- Calibration and limitation of CRO probes
- Analogue and digital a.c. measuring instruments including true root-mean-square reading instruments
- Measurement of the instantaneous, peak, peak-to-peak values and period of sinusoidal and other common waveforms

T4. Phase relationships in a.c. circuits

- Phasor representation of sinusoidal waveforms
- Definitions of in-phase, out-phase, phase angle, lead and lag
- Phasor addition of two voltages or currents

T5. Resistive a.c. circuits

- Ohms law in a.c resistive circuits
- Current and voltage phase relationship
- Power dissipation

T6. Inductance in a.c. circuits

- Principles of inductance
- Units
- Inductive time constant circuits
- Inductive reactance
- Ohms law in inductive a.c. circuits
- Phase relationships
- Verification of operation of RC time constant circuit

T7. Capacitance in a.c. circuits

- Capacitive reactance
- Ohms law in capacitive a.c. circuits
- Current and voltage phase relationships

T8. Series a.c. circuits

- Definition of Impedance
- Impedance

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REQUIRED SKILLS AND KNOWLEDGE

- The impedance triangle
- Voltages distribution
- Vector representation of current and voltages
- Verification of operation of series a.c. circuit

T9. Parallel a.c. circuits

- Current distribution
- Vector representation of voltage and currents
- Impedance calculations based on total circuit current and voltage
- Verification of operation of parallel a.c. circuit

T10. Series-parallel a.c. circuits

- Examples of circuit
- Rules for simplification

T11. Power factor

- Power triangle
- True power
- Apparent power
- Reactive power
- Power factor
- Power factor correction

T12. Ideal transformer

- Construction and operating principles
- Step-up, step-down, turns ratios, voltage and current ratios
- Autotransformer
- Core losses
- Types of cores and applications
- Volt-Ampere (VA) rating
- Verification of operation of transformer circuit

T13. Series resonance

- Conditions in a circuit that produce series resonance
- Relationship between resonance and frequency
- Impedance of a series resonant circuit
- Phasor representation of current and series voltage drops in series resonant circuit
- Voltage magnification
- The Q of a coil and its relevance
- Bandwidth and half power points in a resonant circuit
- Selectivity
- Verification of operation of series resonant circuit

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REQUIRED SKILLS AND KNOWLEDGE

T14. Parallel resonance

- Conditions in a circuit that produce parallel resonance
- Impedance of a parallel resonant circuit
- Vector representation of voltage and parallel branch currents in a parallel resonant circuit
- Current magnification
- Verification of operation of parallel resonant circuit

T15. Filters

- Purpose of a filter
- Circuits for operation of the following passive filter circuits: high pass, low pass, band stop and band pass
- Bandwidth, attenuation, cut-off, roll off and order of filter
- Measurements and calculations relating to passive filters
- Curves showing the behaviour of various types of filter circuits
- Verification of operation of each filter type

Evidence Guide

EVIDENCE GUIDE

9) The evidence guide provides advice on assessment and must be read in conjunction with the Performance Criteria, Required Skills and Knowledge, the Range Statement and the Assessment Guidelines for this Training Package. .

The Evidence Guide forms an integral part of this unit. It must be used in conjunction with all parts of the unit and performed in accordance with the Assessment Guidelines of this Training Package.

Overview of Assessment **9.1)**

Longitudinal competency development approaches to assessment, such as Profiling, require data to be reliably gathered in a form that can be consistently interpreted over time. This approach is best utilised in Apprenticeship programs and reduces assessment intervention. It is the Industry-preferred model for apprenticeships. However, where summative (or final) assessment is used it must include the application of the competency in the normal work environment or, at a minimum, the application of the competency in a realistically simulated work environment. It is recognised that,

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in some circumstances, assessment in part or full can occur outside the workplace. However, it must be in accord with industry and regulatory policy.

Methods chosen for a particular assessment will be influenced by various factors. These include the extent of the assessment, the most effective locations for the assessment activities to take place, access to physical resources, additional safety measures that may be required and the critical nature of the competencies being assessed.

The critical safety nature of working with electricity, electrical equipment, gas or any other hazardous substance/material carries risk in deeming a person competent. Sources of evidence need to be 'rich' in nature to minimise error in judgment.

Activities associated with normal everyday work influence decisions about how/how much the data gathered will contribute to its 'richness'. Some skills are more critical to safety and operational requirements while the same skills may be more or less frequently practised. These points are raised for the assessors to consider when choosing an assessment method and developing assessment instruments. Sample assessment instruments are included for Assessors in the Assessment Guidelines of this Training Package.

Critical aspects of evidence required to demonstrate competency in this unit

9.2)

Before the critical aspects of evidence are considered all prerequisites shall be met.

Evidence for competence in this unit shall be considered holistically. Each Element and associated performance criteria shall be demonstrated on at least two occasions in accordance with the 'Assessment Guidelines – UEE11'. Evidence shall also comprise:

- A representative body of work performance demonstrated within the timeframes typically expected of the discipline, work function and industrial environment. In particular this shall incorporate evidence that shows a candidate is able to:
  - Implement Occupational Health and Safety workplace procedures and practices, including the use of risk control measures as specified in the performance criteria and range

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statement

- Apply sustainable energy principles and practices as specified in the performance criteria and range statement
- Demonstrate an understanding of the essential knowledge and associated skills as described in this unit. It may be required by some jurisdictions that RTOs provide a percentile graded result for the purpose of regulatory or licensing requirements.
- Demonstrate an appropriate level of skills enabling employment
- Conduct work observing the relevant Anti Discrimination legislation, regulations, polices and workplace procedures

- Demonstrated consistent performance across a representative range of contexts from the prescribed items below:
  - Troubleshoot frequency dependent circuits as described in 8) and including:

A	Using methodical problem solving methods.
B	Taking measurements correctly and accurately.
C	Calculating parameters correctly and accurately.
D	Providing solution to resonance circuit problems.
E	Providing written justification for the solutions to problems.
F	Dealing with unplanned events by drawing on essential knowle and skills to provide appropriate solutions incorporated in a ho assessment with the above listed items.

Note:

Successful completion of relevant vendor training may be used to contribute to evid on which competency is deemed. In these cases the alignment of outcomes of vendo training with performance criteria and critical aspects of evidence shall be clearly identified.

Context of and specific resources for assessment

9.3)

This unit should be assessed as it relates to normal work practice using procedures, information and resources typical of a workplace. This should include:

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- OHS policy and work procedures and instructions.
- Suitable work environment, facilities, equipment and materials to undertake actual work as prescribed by this unit.

These should be part of the formal learning/assessment environment.

Note:

Where simulation is considered a suitable strategy for assessment, conditions must be authentic and as far as possible reproduce and replicate the workplace and be consistent with the approved industry simulation policy.

The resources used for assessment should reflect current industry practices in relation to troubleshooting frequency dependent circuits.

Method of assessment **9.4)**

This unit shall be assessed by methods given in Volume 1, Part 3 'Assessment Guidelines'.

Note:
Competent performance with inherent safe working practices is expected in the industry to which this unit applies. This requires that the specified essential knowledge and associated skills are assessed in a structured environment which is primarily intended for learning/assessment and incorporates all necessary equipment and facilities for learners to develop and demonstrate the essential knowledge and skills described in this unit.

Concurrent assessment and relationship with other units **9.5)**

For optimisation of training and assessment effort, competency development in this unit may be arranged concurrently with unit:

UEENEEE10 4A Solve problems in d.c. circuits

The critical aspects of occupational health and safety covered in unit UEENEEE101A and other discipline specific occupational health and safety units shall be incorporated in relation to this unit.

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Range Statement

RANGE STATEMENT

10) This relates to the unit as a whole providing the range of contexts and conditions to which the performance criteria apply. It allows for different work environments and situations that will affect performance.

This unit shall be demonstrated in relation to solving at least two of the following types of resonance circuit problems.

- Determining the operating parameters of an existing circuit
- Altering an existing circuit to comply with specified operating parameters
- Developing circuits to comply with a specified function and operating parameters

Generic terms used throughout this Vocational Standard shall be regarded as part of the Range Statement in which competency is demonstrated. The definition of these and other terms that apply are given in Volume 2, Part 2.1.

Unit Sector(s)

Not applicable.

Competency Field

Competency Field **11)**

Electronics

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UEENEEH169A Solve problems in basic electronic circuits

Modification History

Not applicable.

Unit Descriptor

Unit Descriptor **1) Scope:**

1.1) Descriptor

This competency standard unit covers determining correct operation of single source parallel and series-parallel circuits and providing solutions as they apply to various electronic work functions. It encompasses working safely, problem solving procedures, including the use of voltage, current and resistance measuring devices, providing solutions derived from measurements and calculations to predictable problems in multiple path circuit.

Application of the Unit

Application of the Unit **2)**

This competency standard unit is intended for competency development entry-level employment based programs incorporated in approved contracts of training or approved training programs.

Licensing/Regulatory Information

License to practice **3)**

The skills and knowledge described in this unit requires a licence to practice in the workplace where plant and equipment is directly connected to installation wiring that operates at voltage above 50 V a.c. or 120 V d.c. However other conditions may apply in some jurisdictions subject to regulations related to electrical work. Practice in the workplace and during training is also subject to

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License to practice **3)**

regulations directly related to occupational health and safety and where applicable contracts of training such as apprenticeships and the like.

Pre-Requisites

Prerequisite Unit(s) **4)**

Competencies **4.1)**

Granting competency in this unit shall be made only after competency in the following unit(s) has/have been confirmed.

UEENEEE101A	Apply Occupational Health and Safety regulations, codes and practices in the workplace

Literacy and numeracy skills **4.2)**

Participants are best equipped to achieve this unit if they have reading, writing and numeracy skills indicated by the following scales. Description of each scale is given in Volume 2, Part 3 “Literacy and Numeracy”

Reading 5 Writing 5 Numeracy 5

Employability Skills Information

Employability Skills **5)**

This unit contains Employability Skills

The required outcomes described in this unit of competency contain applicable facets of Employability Skills. The Employability Skills Summary of the qualification in which this unit of competency is packaged will assist in identifying Employability Skill requirements.

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Elements and Performance Criteria Pre-Content

6) Elements describe the essential outcomes of a competency standard unit	Performance Criteria describe the required performance needed to demonstrate achievement of the element. Assessment of performance is to be consistent with the Evidence Guide.

Elements and Performance Criteria

ELEMENT		PERFORMANCE CRITERIA	
1	Prepare to work on electronic circuits	1.1	OHS procedures for a given work area are obtained and understood.
		1.2	OHS risk control work preparation measures and procedures are followed.
		1.3	The nature of the circuit(s) problem is obtained from documentation or from work supervisor to establish the scope of work to be undertaken.
		1.4	Advice is sought from the work supervisor to ensure the work is co-ordinated effectively with others.
		1.5	Sources of materials that may be required for the work are established in accordance with established procedures.
		1.6	Tools, equipment and testing devices needed to carry out the work are obtained and checked for correct operation and safety.
2	Solve electronic circuit problems	2.1	OHS risk control work measures and procedures are followed.
		2.2	The need to test or measure live is determined in strict accordance with OHS requirements and when necessary conducted within established safety procedures.
		2.3	Circuits are checked as being isolated where necessary in strict accordance OHS requirements and procedures.

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ELEMENT	PERFORMANCE CRITERIA	
	2.4	Established methods are used to solving circuit problems from measure and calculated values as they apply to electronic circuit.
	2.5	Unexpected situations are dealt with safely and with the approval of an authorised person.
	2.6	Problems are solved without unnecessary damage to apparatus, circuits, the surrounding environment or services and using sustainable energy practices.
3 Complete work and document problem solving activities	3.1	OHS work completion risk control measures and procedures are followed.
	3.2	Work site is cleaned and made safe in accordance with established procedures.
	3.3	Justification for solutions used to solve circuit problems is documented.
	3.4	Work completion is documented and an appropriate person or persons notified in accordance with established procedures.

Required Skills and Knowledge

REQUIRED SKILLS AND KNOWLEDGE

8) This describes the essential skills and knowledge and their level, required for this unit.

Evidence shall show that knowledge has been acquired of safe working practices and solving problems in electronic circuits.

All knowledge and skills detailed in this unit should be contextualised to current industry practices and technologies.

KS01-EH169A Electronics Circuit Principles

Evidence shall show an understanding of power supplies for electronics circuit principles, applying safe working practices and relevant Standards, Codes and Regulations to an extent indicated by the following aspects:

T1. Basic circuit configurations encompassing:

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REQUIRED SKILLS AND KNOWLEDGE

- circuit configurations are single source a.c. and d.c. circuits,
- series circuits,
- parallel circuits
- series-parallel circuits.

T2. The relationship between variable parameter in electrical /electronic circuits encompassing:

- Variables parameters –
  - voltage,
  - current,
  - resistance
  - impedance,
  - inductance,
  - capacitance
  - reactance.

T3. Behaviour of electrical /electronic circuits for various values of voltage, current, resistance, impedance, inductance, capacitance and reactance and variable parameters encompassing:

- single source circuits,
- series circuit configurations,
- parallel circuit configurations
- series-parallel circuit configurations

T4. Types of voltage testers, multimeters, clamp meters, continuity testers and insulation resistance testers and their application.

T5. Features of testing/measuring devices - safety, user calibration and parameter and range settings.

T6. Connection of test/measuring devices into a circuit encompassing:

- safety procedures
- circuit arrangement of test/measuring devices

T7. Taking readings

T8. Storage, maintenance and care of test/measuring devices.

T9. Australian Standard quality assurance requirements for test equipment calibration certification.

Evidence Guide

EVIDENCE GUIDE

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EVIDENCE GUIDE

9) The evidence guide provides advice on assessment and must be read in conjunction with the Performance Criteria, Required Skills and Knowledge, the Range Statement and the Assessment Guidelines for this Training Package..

The Evidence Guide forms an integral part of this Competency Standard Unit and shall be used in conjunction with all components parts of this unit and, performed in accordance with the Assessment Guidelines of this Training Package.

Overview of Assessment **9.1)**

Longitudinal competency development approaches to assessment, such as Profiling, require data to be reliably gathered in a form that can be consistently interpreted over time. This approach is best utilised in Apprenticeship programs and reduces assessment intervention. It is the Industry's preferred model for apprenticeships. However, where summative (or final) assessment is used it is to include the application of the competency in the normal work environment or, at a minimum, the application of the competency in a realistically simulated work environment. It is recognised that, in some circumstances, assessment in part or full can occur outside the workplace. However, it must be in accord with Industry and, Regulatory policy in this regard.

Methods chosen for a particular assessment will be influenced by various factors. These include the extent of the assessment, the most effective locations for the assessment activities to take place, access to physical resources, additional safety measures that may be required and the critical nature of the competencies being assessed.

The critical safety nature of working with electricity, electrical equipment, gas or any other hazardous substance/material carries risk in deeming a person competent. Hence, sources of evidence need to be 'rich' in nature so as to minimise error in judgment.

Activities associated with normal every day work have a bearing on the decision as to how much and how detailed the data gathered will contribute to its 'richness'. Some skills are more critical to safety and operational requirements while the same skills may be more or less frequently practised. These points are raised for the assessors to consider when choosing an assessment method and developing assessment instruments. Sample assessment instruments are included for Assessors in the Assessment Guidelines of this Training Package.

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Critical aspects of evidence required to demonstrate competency in this unit

9.2)

Before the critical aspects of evidence are considered all prerequisites shall be met.

Evidence for competence in this unit shall be considered holistically. Each element and associated performance criteria shall be demonstrated on at least two occasions in accordance with the "Assessment Guidelines – UEE11". Evidence shall also comprise:

A representative body of work performance demonstrated within the timeframes typically expected of the discipline, work function and industrial environment. In particular this shall incorporate evidence that shows a candidate is able to:

- Implement Occupational Health and Safety workplace procedures and practices including the use of risk control measures as specified in the performance criteria and range; and
- Apply sustainable energy principles and practices as specified in the performance criteria and range; and
- Demonstrate an understanding of the essential knowledge and associated skills as described in this unit. It may be required by some jurisdictions that RTOs provide a percentile graded result for the purpose of regulatory or licensing requirements. and
- Demonstrate an appropriate level of skills enabling employment; and
- Conduct work observing the relevant Anti Discrimination legislation, regulations, polices and workplace procedures; and

Demonstrated consistent performance across a representative range of contexts from the prescribed items below:

- Solving problems in electronic circuits as described in 8) and including:

a. Determining the operating parameters of an existing circuit.
b. Altering an existing circuit to comply with specified operating parameters.
c. Developing circuits to comply with a specified function and operating parameters.
d. Dealing with unplanned events by drawing on essential

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knowledge and skills to provide appropriate solutions incorporated in the holistic assessment with the above listed items.

Context of and specific resources for assessment

9.3)

This unit should be assessed as it relates to normal work practice using procedures, information and resources typical of a workplace. This should include:

OHS policy and work procedures and instructions.

- Suitable work environment, facilities, equipment and materials to undertake actual work as prescribed by this competency standard unit.

Resources required to assess this unit are listed above in Context of assessment', which should also be used in the formal learning/assessment environment.

Note:

Where simulation is considered a suitable strategy for assessment it must ensure that the conditions for assessment are authentic and as far as possible reproduce and replicate the workplace and is consistent with the approved industry simulation policy.

The resources used for assessment should reflect current industry practices in relation to in solving problems in electronic circuits.

Method of assessment

9.4)

This competency standard unit shall be assessed by methods given in Volume 1, Part 3 "Assessment Guidelines".

Note:

Competent performance with inherent safe working practices is expected in the Industry to which this competency standard unit applies. This requires that the specified essential knowledge and associated skills are assessed in a structured environment which is primarily intended for learning/assessment and incorporates all necessary equipment and facilities for learners to develop and demonstrate the essential knowledge and skills described in this unit.

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Concurrent assessment and relationship with other units **9.5)**

There are no concurrent assessment recommendations for this unit.

The critical aspects of occupational health and safety covered in unit UEENEEE101A and other discipline specific occupational health and safety units shall be incorporated in relation to this unit.

Range Statement

RANGE STATEMENT

10) This relates to the unit of competency as a whole providing the range of contexts and conditions to which the performance criteria apply. It allows for different work environments and situations that will affect performance.

This competency standard unit shall be demonstrated in relation to:

Single source parallel and series-parallel electronic circuits as they apply to operational circuit functions in relation to at least two of the following types of circuit problems and on at least two occasions:

- Determining the operating parameters of an existing circuit
- Altering an existing circuit to comply with specified operating parameters
- Developing circuits to comply with a specified function and operating parameters

Generic terms are used throughout this Vocational Standard shall be regarded as part of the Range of Variables in which competency is demonstrated. The definition of these and other terms that apply are given in Volume 2, Part 2.1.

Unit Sector(s)

Not applicable.

Competency Field

Competency Field **11)**

Electrotechnology

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UEENEEI101A Use instrumentation drawings, specification, standards and equipment manuals

Modification History

Not applicable.

Unit Descriptor

Unit Descriptor **1) Scope:**

1.1) Descriptor

This unit covers using drawings, specifications, standards and equipment manual applicable to installing, maintaining and fault finding process controls. It encompasses the principles of process control embodied in drawings, standards, specifications and equipment manuals, matching equipment with that specified for a given function and location and determining the connections required between pneumatic, hydraulic and electrical equipment from instrumentation drawings and specifications

Application of the Unit

Application of the Unit **2)**

This unit is intended for competency development in entry-level employment based programs incorporated in approved contracts of training.

Licensing/Regulatory Information

License to practice **3)**

The skills and knowledge described in this unit require a license to practice in the workplace where plant and equipment operate at voltage above 50 V a.c. or 120 V d.c. However other conditions may apply in some jurisdictions subject to regulations related to electrical

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License to practice **3)**

work. Practice in the workplace and during training is also subject to regulations directly related to occupational health and safety and where applicable contracts of training such as apprenticeships.

Note:

1. Compliance with permits may be required in various jurisdictions and typically relates to the operation of plant, machinery and equipment such as elevating work platforms, powder operated fixing tools, power operated tools, vehicles, road signage and traffic control and lifting equipment. Permits may also be required for some work environments such as confined spaces, working aloft, near live electrical apparatus and site rehabilitation.

2. Compliance may be required in various jurisdictions relating to currency in First Aid, confined space and lifting and risk safety measures.

Pre-Requisites

Prerequisite Unit(s) **4)**

Competencies **4.1)**

Granting competency in this unit shall be made only after competency in the following unit(s) has/have been confirmed.

UEENEEE101A	Apply Occupational Health Safety regulations, codes and practices in the workplace`
UEENEEE107A	Use drawings, diagrams, schedules, standards, codes and specifications

Literacy and numeracy skills **4.2)**

Participants are best equipped to achieve competency in this unit if they have reading, writing and numeracy skills indicated by the following scales. Description of each scale is given in Volume 2, Part 3 ‘Literacy and

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Numeracy'

Reading 3 Writing 3 Numeracy 3

Employability Skills Information

Employability Skills **5)**

This unit contains Employability Skills

The required outcomes described in this unit of competency contain applicable facets of Employability Skills. The Employability Skills Summary of the qualification in which this unit of competency is packaged will assist in identifying Employability Skill requirements.

Elements and Performance Criteria Pre-Content

6) Elements describe the essential outcomes of a competency standard unit

Performance Criteria describe the required performance needed to demonstrate achievement of the element. Assessment of performance is to be consistent with the Evidence Guide.

Elements and Performance Criteria

ELEMENT	PERFORMANCE CRITERIA
1 Prepare to use instrumentation drawings, specification, standards and equipment manuals.	1.1 Established OHS risk control measures and procedures are followed.
	1.2 The need for instrumentation drawings, specification, standards or equipment manuals is determined from the nature of the work to be undertaken.
	1.3 Established routines and procedures are followed to obtain instrumentation drawings, specification, standards or equipment manuals required for the work to be undertaken.
2 Use instrumentation	2.1 Instrumentation drawings, specification,

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ELEMENT	PERFORMANCE CRITERIA	
drawings, specification, standards and equipment manuals		standards and/or equipment manuals are selected, appropriate to the work being undertaken.
	2.2	Instrumentation drawings, specification, standards and equipment manuals are interpreted using knowledge of process controls and instrumentation drawing layouts, conventions and symbols.
	2.3	Dimensions are extracted from drawings and diagrams for application to work undertaken.
	2.4	Location of equipment is determined from instrumentation drawings and specification.
	2.5	Connections between pneumatic, hydraulic and electrical equipment are determined from instrumentation drawings and specifications
	2.6	Equipment manuals are reviewed to ascertain their format and where information relevant to the work to be undertaken is located.
	2.7	Information given in equipment manuals is interpreted in relation to the work to be undertaken.
3 Convey instrumentation information and ideas using drawings and diagrams.	3.1	Drawing conventions are used in neat freehand drawings to convey instrumentation information and ideas to others involved in the work to be undertaken.
	3.2	Instrumentation drawing conventions are used to neatly correct freehand original job drawing to show final ‘as-installed’ arrangement.
	3.3	Corrected drawings are forwarded to appropriate person(s) in accordance with established procedures.

Required Skills and Knowledge

REQUIRED SKILLS AND KNOWLEDGE

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REQUIRED SKILLS AND KNOWLEDGE

8) This describes the essential skills and knowledge and their level, required for this unit.

Evidence shall show that knowledge has been acquired of safe working practices and using instrumentation drawings, specification, standards and equipment manuals.

All knowledge and skills detailed in this unit should be contextualised to current industry practices and technologies.

KS01-EI101A Concepts and Practices of Industrial Instrumentation

Evidence shall show an understanding of the concepts of industrial instrumentation and the basic practices to an extent indicated by the following aspects:

T1 Industrial Instrumentation encompassing:

- Introduction to the purposes of measurement in industrial processes
- Instrument control loops
- Types of measurement in these processes
- Local and remote measurement
- Measurement signal methods
- Signal transmissions electrical standards
- Signal transmissions pneumatic standards
- Flow, temperature, pressure and other appropriate measurements.
- Identification and purpose of instruments measuring processes directly and those measuring indirectly.
- Instrumentation and control components: sensors, transducers, converters and transmitters.

T2 Instrument Standards encompassing:

- Instrumentation standards
- Relationship between standards
- Using standards
- Fluids in Process Piping Colour Coding.
- Instruments symbols

T3 Instrumentation Terminology and SI units encompassing:

- SI base units
- SI derived units
- Scientific notation and engineering notation
- SI prefixes.
- Instrumentation metric units
- Non-standard SI Units - kg/cm2, etc.
- Conversion of units
- Instrumentation terminology:
  - Span

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REQUIRED SKILLS AND KNOWLEDGE

- Range
- Accuracy
- Precision
- Errors
- Zero
- Repeatability
- Sensitivity
- Hysteresis

T4 Calibration of link and lever instruments encompassing:

- Principles of levers and links and calibration of indicator recorder instrument
- Calibration terms
- Calibrate a link and lever instrument
- Interpret calibration data so as to identify the types of error displayed by an instrument and whether the instrument is within its specified accuracy.
- Interpretation of graphs and tables associated with instrumentation

T5 Instrumentation safe working practices encompassing:

- Identification of instrumentation and control hazards
- Risk control measures for instrumentation work.
- Risk assessment

T6 Instrumentation drawings, diagrams and manuals encompassing:

- Electrotechnology drawing symbols for instrumentation and control (electrical/electronic circuits; Instrument circuits/diagrams; PLC diagrams; pneumatic; hydraulic)
- tandards used in Instrumentation drawings (ISA; ASME; AS; SAMA).
- Drawings used in Instrumentation - schematic; single line; wiring; PLC diagrams; process flow diagrams - brief instrument information; process loop diagrams - details, terminals, types of instruments.
- Manufacturers Data Sheets, Manuals, Specifications and Test Procedures - instrumentation Manuals, Catalogues and Drawings.
    - Interpretation of the specifications contained within instrumentation Manuals, Catalogues and Drawings.
    - Interpretation of the test procedures contained within instrumentation Manuals, Catalogues and Drawings.
    - Comparison of data presented in different forms for the same equipment.
    - Identification of data relevant to instrumentation from a range of publicity material.
    - Extraction of information such as calibration, testing or installation procedures from manuals, specification sheets and drawings.
- Quantity take-offs and Parts Lists

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REQUIRED SKILLS AND KNOWLEDGE

- Part Numbers for components, assemblies and equipment.
- Parts List for a specified project or installation from Manuals, Catalogues, Specifications and Drawings.
- List of equipment, required to undertake a specified project or installation, from Manuals, Catalogues, Specifications and Drawings.
- Identification and extraction of a Part Number for an actual sample component or part from a Manual, Catalogue, Specification and/or Drawing
- Sketching of instrumentation and control drawings:
  - Sketching a schematic circuit diagram from a given circuit board layout diagram, wiring or installation drawing and installation or modification of a specified project using information contained within Manuals,
  - Sketching a part or equipment layout needed to perform a specified task, such as installation or modification, from given Manuals, Catalogues, Specifications and Drawings

Evidence Guide

EVIDENCE GUIDE

9) The evidence guide provides advice on assessment and must be read in conjunction with the Performance Criteria, Required Skills and Knowledge, the Range Statement and the Assessment Guidelines for this Training Package.

The Evidence Guide forms an integral part of this unit. It must be used in conjunction with all parts of the unit and performed in accordance with the Assessment Guidelines of this Training Package.

Overview of Assessment **9.1)**

Longitudinal competency development approaches to assessment, such as Profiling, require data to be reliably gathered in a form that can be consistently interpreted over time. This approach is best utilised in Apprenticeship programs and reduces assessment intervention. It is the industry-preferred model for apprenticeships. However, where summative (or final) assessment is used it is to include the application of the competency in the normal work environment or, at a minimum, the application of the competency in a realistically simulated work environment. In some circumstances, assessment in part or full can occur outside the workplace. However, it must be in accordance with industry and

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regulatory policy.

Methods chosen for a particular assessment will be influenced by various factors. These include the extent of the assessment, the most effective locations for the assessment activities to take place, access to physical resources, additional safety measures that may be required and the critical nature of the competencies being assessed.

The critical safety nature of working with electricity, electrical equipment, gas or any other hazardous substance/material carries risk in deeming a person competent. Sources of evidence need to be 'rich' in nature to minimise error in judgment.

Activities associated with normal everyday work influence how/how much the data gathered will contribute to its 'richness'. Some skills are more critical to safety and operational requirements while the same skills may be more or less frequently practised. These points are raised for the assessors to consider when choosing an assessment method and developing assessment instruments. Sample assessment instruments are included for Assessors in the Assessment Guidelines of this Training Package.

Critical aspects of evidence required to demonstrate competency in this unit

9.2)

Before the critical aspects of evidence are considered all prerequisites must be met.

Evidence for competence in this unit shall be considered holistically. Each Element and associated performance criteria must be demonstrated on at least two occasions in accordance with the 'Assessment Guidelines – UEE11'. Evidence shall also comprise:

- A representative body of work performance demonstrated within the timeframes typically expected of the discipline, work function and industrial environment. In particular this shall incorporate evidence that shows a candidate is able to:
  - Implement Occupational Health and Safety workplace procedures and practices, including the use of risk control measures as specified in the performance criteria and range statement
  - Apply sustainable energy principles and practices as specified in the performance criteria and range statement

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- Demonstrate an understanding of the essential knowledge and associated skills as described in this unit. It may be required by some jurisdictions that RTOs provide a percentile graded result for the purpose of regulatory or licensing requirements.
- Demonstrate an appropriate level of skills enabling employment
- Conduct work observing the relevant Anti Discrimination legislation, regulations, polices and workplace procedures

- Demonstrated consistent performance across a representative range of contexts from the prescribed items below:
  - Use instrumentation drawings, specification, standards and equipment manuals as described in 8) and including:

A Identifying instrumentation drawings, specification, standards and equipment manuals relevant to the work to be undertaken.

B Interpreting instrumentation drawings, specification, standards and equipment manuals using knowledge of process controls and instrumentation drawing layouts, conventions and symbols.

C Determining location of equipment from instrumentation drawings and specification

D Determining connections between pneumatic, hydraulic and electrical equipment correctly

E Using correct conventions in freehand drawings.

F Giving correct information in freehand drawings.

G Dealing with unplanned event

Context of and specific resources for assessment

9.3)

This unit must be assessed as it relates to normal work practice using procedures, information and resources typical of a workplace. This should include:

- OHS policy and work procedures and instructions.
- Suitable work environment, facilities, equipment and materials to undertake actual work as prescribed by this unit.

These should be part of the formal learning/assessment

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environment.

Note: Where simulation is considered a suitable strategy for assessment, the conditions must be authentic and as far as possible reproduce and replicate the workplace and be consistent with the approved industry simulation policy.

The resources used for assessment should reflect current industry practices in relation to instrumentation drawings, specification, standards and equipment manuals

Method of assessment

9.4)

This unit shall be assessed by methods given in Volume 1, Part 3 'Assessment Guidelines'.

Note: Competent performance with inherent safe working practices is expected in the Industry to which this unit applies. This requires assessment in a structured environment which is intended primarily for learning/assessment and incorporates all necessary equipment and facilities for learners to develop and demonstrate the essential knowledge and skills described in this unit.

Concurrent assessment and relationship with other units

9.5)

For optimisation of training and assessment effort, competency development in this unit may be arranged concurrently with unit:

UEENEEE107A	Use drawings, diagrams, schedules, standards, codes and specifications

Range Statement

RANGE STATEMENT

10) This relates to the unit as a whole providing the range of contexts and conditions to which the performance criteria apply. It allows for different work environments and situations that will affect performance.

This unit must be demonstrated in relation to instrumentation assembly, installation,

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RANGE STATEMENT

fault finding, maintenance or development work functions using at instrumentation drawings, specification, standards and equipment manuals for least two different process control systems

Generic terms used throughout this Vocational Standard shall be regarded as part of the Range Statement in which competency is demonstrated. The definition of these and other terms that apply are given in Volume 2, Part 2.1.

Unit Sector(s)

Not applicable.

Competency Field

Competency Field **11)**

Instrumentation and Control

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UEENEEI107A Install instrumentation and control cabling and tubing

Modification History

		UEENEEI107A	Install instrumentation and control cabling and tubing	
Release	Action	Core/Elective	Details	Points
2	Editorial	N/A	Show full pre-req chain in the unit.	
2	Editorial	N/A	In Pre-requisites, delete "For the full prerequisite chain details for this unit please refer to Table 2 in Volume 1, Part 2".	
2	Editorial	N/A	In Required Skills and Knowledge, insert topic numbering.	
2	Editorial	N/A	Replace “essential knowledge and associated skills” with “required skills and knowledge”.	

Unit Descriptor

Unit Descriptor **1) Scope:**

1.1) Descriptor

This unit covers the installation and termination of instrument and control cabling and tubing for chemical, industrial or food processing systems or equipment used in medical procedures. It encompasses working safely and to standards, routing cables and tubing to specified locations, terminating cables and tubing and connecting wiring at accessories and at instruments and control apparatus and completing the necessary installation documentation.

Application of the Unit

Application of the Unit **2)**

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This unit covers the installation and termination of instrument and control cabling and tubing for chemical, industrial or food processing systems or equipment used in medical procedures. It encompasses working safely and to standards, routing cables and tubing to specified locations, terminating cables and tubing and connecting wiring at accessories and at instruments and control apparatus and completing the necessary installation documentation.

Licensing/Regulatory Information

License to practice **3)**

The skills and knowledge described in this unit require a license to practice in the workplace where plant and equipment operate at voltage above 50 V a.c. or 120 V d.c. However other conditions may apply in some jurisdictions subject to regulations related to electrical work. Practice in the workplace and during training is also subject to regulations directly related to occupational health and safety and where applicable contracts of training such as apprenticeships.

Note:

1. Compliance with permits may be required in various jurisdictions and typically relates to the operation of plant, machinery and equipment such as elevating work platforms, powder operated fixing tools, power operated tools, vehicles, road signage and traffic control and lifting equipment. Permits may also be required for some work environments such as confined spaces, working aloft, near live electrical apparatus and site rehabilitation.

2. Compliance may be required in various jurisdictions relating to currency in First Aid, confined space and lifting and risk safety measures.

Pre-Requisites

Prerequisite Unit(s) **4)**

Competencies **4.1)**

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Prerequisite Unit(s) **4)**

Granting competency in this unit shall be made only after competency in the following unit(s) has/have been confirmed

UEENEEE101A	Apply Occupational Health and Safety regulations, codes and practices in the workplace
UEENEEE107A	Use drawings, diagrams, schedules, standards, codes and specifications
UEENEEI101A	Use instrumentation drawings, specification, standards and equipment manuals

Literacy and numeracy skills **4.2)**

Participants are best equipped to achieve competency in this unit if they have reading, writing and numeracy skills indicated by the following scales. Description of each scale is given in Volume 2, Part 3 ‘Literacy and Numeracy’

Reading	3	Writing	3	Numeracy	3

Employability Skills Information

Employability Skills **5)**

This unit contains Employability Skills

The required outcomes described in this unit of competency contain applicable facets of Employability Skills. The Employability Skills Summary of the qualification in which this unit of competency is packaged will assist in identifying Employability Skill requirements.

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Elements and Performance Criteria Pre-Content

6) Elements describe the essential outcomes of a competency standard unit	Performance Criteria describe the required performance needed to demonstrate achievement of the element. Assessment of performance is to be consistent with the Evidence Guide.

Elements and Performance Criteria

ELEMENT	PERFORMANCE CRITERIA	
1 Prepare to install cabling and tubing	1.1	OHS procedures for a given work area are identified, obtained and understood
	1.2	Health and safety risks are identified, and established risk control measures and procedures in preparation for the work are followed.
	1.3	Safety hazards that have not previously been identified are noted, and established risk control measures are implemented.
	1.4	Installation of cabling and tubing is prepared in consultation with other affected by the work and sequenced appropriately.
	1.5	The nature and location of the work is determined from documentation or appropriate person(s) to establish the scope of work to be undertaken.
	1.6	Cable and tube routes are planned within the constraints of the building and plant structure, significants and regulations.
	1.7	Advice is sought from appropriate persons to ensure the work is coordinated effectively with others.
	1.8	Material needed for the installation work is obtained in accordance with established procedures and checked against job requirements.
	1.9	Tools, equipment and testing devices needed to for the installation work are obtained in accordance with established procedures and

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ELEMENT	PERFORMANCE CRITERIA	
		checked for correct operation and safety.
	1.10	Preparatory work is checked to ensure no damage has occurred and that work complies with requirements.
2 Install cabling, tubing and accessories	2.1	OHS risk control measures and procedures for carrying out the work are followed.
	2.2	Plant/machines/equipment are checked as being isolated where necessary in strict accordance OHS requirements and procedures
	2.3	Cabling, tubing and accessories are installed to comply with technical standards and job specifications and requirements with sufficient excess to affect terminations.
	2.4	Accessories are installed in the required locations and within acceptable tolerances.
	2.5	Cables and conductors are terminated at accessories in accordance with manufacture’s specifications and regulatory requirements
	2.6	Tubing is terminated at accessories in accordance with manufacture’s specifications and regulatory requirements
	2.7	Established methods for dealing with unexpected situations are discussed with appropriate person or persons and documented.
	2.8	Unexpected situations are dealt with safely and with the approval of an authorised person.
	2.9	Ongoing checks of the quality of installed wiring are undertaken in accordance with established procedures.
	2.10	Cabling and tubing installation is carried out efficiently without waste of materials and energy or damage to apparatus, the surrounding environment or services and using sustainable energy principles.
3 Completion and	3.1	OHS work completion risk control measures and

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ELEMENT	PERFORMANCE CRITERIA	
report installation activities		procedures are followed.
	3.2	Work site is cleaned and made safe in accordance with established procedures.
	3.3	Final checks are made to that the installed wiring conforms to requirements.
	3.4	'As-installed' cables, tubes and accessories are documented and appropriate person(s) notified in accordance with established procedures

Required Skills and Knowledge

REQUIRED SKILLS AND KNOWLEDGE

8) This describes the required skills and knowledge and their level, required for this unit.

Evidence shall show that knowledge has been acquired of safe working practices and installing instrumentation and control cabling and tubing.

All knowledge and skills detailed in this unit should be contextualised to current industry practices and technologies.

KS01-EI107A Instrumentation and control cables, conductors and tubing

Evidence shall show an understanding of instrumentation and control cables, conductors and tubing to an extent indicated by the following aspects:

T1 Instrumentation cable types and terminations encompassing:

- Cable specifications
- Cable applications
- Cable preparation
- Cable termination
- Connection hardware

T2 Instrumentation pneumatic/hydraulic control tubing/piping encompassing:

- Control tubing/piping
- Pneumatic/hydraulic terms
- Cutting pipe tubing/piping

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REQUIRED SKILLS AND KNOWLEDGE

- Bending, shaping/setting pipe and tubing
- Joining connecting/terminating tubing/piping
- Instrumentation air supply maintenance

Evidence Guide

EVIDENCE GUIDE

9) The evidence guide provides advice on assessment and must be read in conjunction with the Performance Criteria, Required Skills and Knowledge, the Range Statement and the Assessment Guidelines for this Training Package.

The Evidence Guide forms an integral part of this unit. It must be used in conjunction with all parts of the unit and performed in accordance with the Assessment Guidelines of this Training Package.

Overview of Assessment **9.1)**

Longitudinal competency development approaches to assessment, such as Profiling, require data to be reliably gathered in a form that can be consistently interpreted over time. This approach is best utilised in Apprenticeship programs and reduces assessment intervention. It is the industry-preferred model for apprenticeships. However, where summative (or final) assessment is used it is to include the application of the competency in the normal work environment or, at a minimum, the application of the competency in a realistically simulated work environment. In some circumstances, assessment in part or full can occur outside the workplace. However, it must be in accordance with industry and regulatory policy.

Methods chosen for a particular assessment will be influenced by various factors. These include the extent of the assessment, the most effective locations for the assessment activities to take place, access to physical resources, additional safety measures that may be required and the critical nature of the competencies being assessed.

The critical safety nature of working with electricity, electrical equipment, gas or any other hazardous substance/material carries risk in deeming a person competent. Sources of evidence need to be ‘rich’ in nature to minimise error in judgment.

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Activities associated with normal everyday work influence how/how much the data gathered will contribute to its 'richness'. Some skills are more critical to safety and operational requirements while the same skills may be more or less frequently practised. These points are raised for the assessors to consider when choosing an assessment method and developing assessment instruments. Sample assessment instruments are included for Assessors in the Assessment Guidelines of this Training Package.

Critical aspects of evidence required to demonstrate competency in this unit

9.2)

Before the critical aspects of evidence are considered all prerequisites must be met.

Evidence for competence in this unit shall be considered holistically. Each Element and associated performance criteria must be demonstrated on at least two occasions in accordance with the 'Assessment Guidelines – UEE11'. Evidence shall also comprise:

- A representative body of work performance demonstrated within the timeframes typically expected of the discipline, work function and industrial environment. In particular this shall incorporate evidence that shows a candidate is able to:
  - Implement Occupational Health and Safety workplace procedures and practices, including the use of risk control measures as specified in the performance criteria and range statement
  - Apply sustainable energy principles and practices as specified in the performance criteria and range statement
  - Demonstrate an understanding of the required skills and knowledge as described in this unit. It may be required by some jurisdictions that RTOs provide a percentile graded result for the purpose of regulatory or licensing requirements.
  - Demonstrate an appropriate level of skills enabling employment
  - Conduct work observing the relevant Anti Discrimination legislation, regulations, polices and workplace procedures
- Demonstrated consistent performance across a representative range of contexts from the prescribed items below:

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- Install instrumentation and control cabling and tubing as listed as described in 8) and including:

A Reading and interpreting drawings related to cable and tube layouts, schedules and control apparatus locations

B Routing, placing and securing cables and tubing to comply with requirements

C Placing and securing accessories accurately

D Maintaining fire integrity

E Terminating cables and tubing to comply with requirements

F Dealing with unplanned events by drawing on required skills and knowledge to provide appropriate solutions incorporated in a holistic assessment with the above listed items

Note:

Successful completion of relevant vendor training may be used to contribute to evidence on which competency is deemed. In these cases the alignment of outcomes of vendor training with performance criteria and critical aspects of evidence shall be clearly identified

Context of and specific resources for assessment

9.3)

This unit must be assessed as it relates to normal work practice using procedures, information and resources typical of a workplace. This should include:

- OHS policy and work procedures and instructions.
- Suitable work environment, facilities, equipment and materials to undertake actual work as prescribed by this unit.

These should be part of the formal learning/assessment environment.

Note:

Where simulation is considered a suitable strategy for assessment,

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the conditions must be authentic and as far as possible reproduce and replicate the workplace and be consistent with the approved industry simulation policy.

The resources used for assessment should reflect current industry practices in relation to installing instrumentation and control cabling and tubing.

Method of assessment

9.4)

This unit shall be assessed by methods given in Volume 1, Part 3 'Assessment Guidelines'.

Note:

Competent performance with inherent safe working practices is expected in the Industry to which this unit applies. This requires assessment in a structured environment which is intended primarily for learning/assessment and incorporates all necessary equipment and facilities for learners to develop and demonstrate the required skills and knowledge described in this unit.

Concurrent assessment and relationship with other units

9.5)

For optimisation of training and assessment effort, competency development in this unit may be arranged concurrently with unit:

UEENEEI108A	Install instrumentation and control apparatus and associated equipment

The critical aspects of occupational health and safety covered in unit UEENEEE101A and other discipline specific occupational health and safety units shall be incorporated in relation to this unit.

Range Statement

RANGE STATEMENT

10) This relates to the unit as a whole providing the range of contexts and conditions to which the performance criteria apply. It allows for different work environments and

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RANGE STATEMENT

situations that will affect performance.

This unit must be demonstrated in relation to at least three different wiring systems and two types of tubing.

Note:

1. Examples of wiring systems include armoured cable; fire performance cables e.g. MIMS; thermoplastic insulated cable; thermoplastic sheathed cable; UTP, FTP, STP and coaxial communications cables.

2. Tubing types include low pressure metallic and non-metallic tubing and high pressure tubing

Generic terms used throughout this Vocational Standard shall be regarded as part of the Range Statement in which competency is demonstrated. The definition of these and other terms that apply are given in Volume 2, Part 2.1.

Unit Sector(s)

Not applicable.

Competency Field

Competency Field **11)**

Instrumentation and Control

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UEENEEI108A Install instrumentation and control apparatus and associated equipment

Modification History

Not applicable.

Unit Descriptor

Unit Descriptor **1) Scope:**

1.1) Descriptor

This unit covers the installation of measurement, monitoring and control apparatus and associated equipment. It encompasses working safely and to installation standards, matching equipment with that specified for a given location, placing and securing equipment accurately, making required pneumatic, hydraulic and electrical circuit connections and completing the necessary installation documentation.

Application of the Unit

Application of the Unit **2)**

This unit is intended for competency development in entry-level employment based programs incorporated in approved contracts of training.

Licensing/Regulatory Information

License to practice **3)**

The skills and knowledge described in this unit require a license to practice in the workplace where plant and equipment operate at voltage above 50 V a.c. or 120 V d.c. However other conditions may apply in some jurisdictions subject to regulations related to electrical work. Practice in the workplace and during training is also subject to regulations directly related to occupational

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License to practice **3)**

health and safety and where applicable contracts of training such as apprenticeships.

Note:

1. Compliance with permits may be required in various jurisdictions and typically relates to the operation of plant, machinery and equipment such as elevating work platforms, powder operated fixing tools, power operated tools, vehicles, road signage and traffic control and lifting equipment. Permits may also be required for some work environments such as confined spaces, working aloft, near live electrical apparatus and site rehabilitation.

2. Compliance may be required in various jurisdictions relating to currency in First Aid, confined space and lifting and risk safety measures.

Pre-Requisites

Prerequisite Unit(s) **4)**

Competencies **4.1)**

Granting competency in this unit shall be made only after competency in the following unit(s) has/have been confirmed.

UEENEEE101A	Apply Occupational Health Safety regulations, codes and practices in the workplace`
UEENEEE107A	Use drawings, diagrams, schedules, standards, codes and specifications
UEENEEI101A	Use instrumentation drawings, specification, standards and equipment manuals

Literacy and numeracy skills **4.2)**

Participants are best equipped to achieve competency in this unit if they have reading, writing and numeracy skills

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indicated by the following scales. Description of each scale is given in Volume 2, Part 3 'Literacy and Numeracy'

Reading 3 Writing 3 Numeracy 3

Employability Skills Information

Employability Skills **5)**

This unit contains Employability Skills

The required outcomes described in this unit of competency contain applicable facets of Employability Skills. The Employability Skills Summary of the qualification in which this unit of competency is packaged will assist in identifying Employability Skill requirements.

Elements and Performance Criteria Pre-Content

6) Elements describe the essential outcomes of a competency standard unit

Performance Criteria describe the required performance needed to demonstrate achievement of the element. Assessment of performance is to be consistent with the Evidence Guide.

Elements and Performance Criteria

ELEMENT	PERFORMANCE CRITERIA
1 Prepare to instrumentation and control apparatus and associated equipment	1.1 OHS procedures for a given work area are identified, obtained and understood
	1.2 Health and safety risks are identified and established risk control measures and procedures in preparation for the work are followed.
	1.3 Safety hazards that have not previously been identified are noted, and established risk control measures are implemented.
	1.4 Installation of apparatus is prepared in

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ELEMENT	PERFORMANCE CRITERIA	
		consultation with other affected by the work and sequenced appropriately.
	1.5	The nature and location of the work is determined from documentation or appropriate person(s) to establish the scope of work to be undertaken.
	1.6	Location of instrumentation and control apparatus and associated equipment is planned within the constraints of the building structure, significants and regulations.
	1.7	Advice is sought from appropriate persons to ensure the work is coordinated effectively with others.
	1.8	Material needed for the installation work is obtained in accordance with established procedures and checked against job requirements.
	1.9	Tools, equipment and testing devices needed to for the installation work are obtained in accordance with established procedures and checked for correct operation and safety.
	1.10	Preparatory work is checked to ensure no damage has occurred and that work complies with requirements.
2 Install instrumentation and control apparatus and associated equipment	2.1	OHS risk control measures and procedures for carrying out the work are followed.
	2.2	The need to test or measure live is determined in strict accordance with OHS requirements and when necessary conducted within established safety procedures.
	2.3	Circuits/machines/plant are checked as being isolated where necessary in strict accordance OHS requirements and procedures
	2.4	Instrumentation and control apparatus and associated equipment is installed to comply with technical standards and job specifications and requirements with sufficient access to affect

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ELEMENT	PERFORMANCE CRITERIA	
		terminations, adjustment and maintenance.
	2.5	Wiring and tubing is terminated at instrumentation and control apparatus and associated equipment in accordance with manufacture's specifications and functional and regulatory requirements.
	2.6	Established methods for dealing with unexpected situations are discussed with appropriate person or persons and documented.
	2.7	Unexpected situations are dealt with safely and with the approval of an authorised person.
	2.8	Ongoing checks of the quality of installed apparatus are undertaken in accordance with established procedures.
	2.9	Apparatus installation is carried out efficiently without waste of materials or damage to apparatus, circuits, the surrounding environment or services and using sustainable energy principles.
3 Completion and report installation activities	3.1	OHS work completion risk control measures and procedures are followed.
	3.2	Work site is cleaned and made safe in accordance with established procedures.
	3.3	Final checks are made to that the installed apparatus conforms to requirements.
	3.4	'As-installed' apparatus and associated equipment is documented and appropriate person(s) notified in accordance with established procedures

Required Skills and Knowledge

REQUIRED SKILLS AND KNOWLEDGE

8) This describes the essential skills and knowledge and their level, required for this

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REQUIRED SKILLS AND KNOWLEDGE

unit.

Evidence shall show that knowledge has been acquired of safe working practices and installing instrumentation and control apparatus and associated equipment.

All knowledge and skills detailed in this unit should be contextualised to current industry practices and technologies.

KS01-EI108A **Instrumentation and control equipment installation requirements and techniques**

Evidence shall show an understanding of instrumentation and control equipment installation requirements and techniques to an extent indicated by the following aspects:

Regulatory requirements

- Equipment specification
- Manufacturer’s installation instructions
- System specifications
- Communication/signal cabling installation requirements
- Power wiring requirements
- Initial set up procedures

Evidence Guide

EVIDENCE GUIDE

9) The evidence guide provides advice on assessment and must be read in conjunction with the Performance Criteria, Required Skills and Knowledge, the Range Statement and the Assessment Guidelines for this Training Package.

The Evidence Guide forms an integral part of this unit. It must be used in conjunction with all parts of the unit and performed in accordance with the Assessment Guidelines of this Training Package.

Overview of Assessment **9.1)**

Longitudinal competency development approaches to assessment, such as Profiling, require data to be reliably gathered in a form that can be consistently interpreted over time. This approach is best utilised in Apprenticeship programs and reduces assessment intervention. It is the industry-preferred model for apprenticeships.

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However, where summative (or final) assessment is used it is to include the application of the competency in the normal work environment or, at a minimum, the application of the competency in a realistically simulated work environment. In some circumstances, assessment in part or full can occur outside the workplace. However, it must be in accordance with industry and regulatory policy.

Methods chosen for a particular assessment will be influenced by various factors. These include the extent of the assessment, the most effective locations for the assessment activities to take place, access to physical resources, additional safety measures that may be required and the critical nature of the competencies being assessed.

The critical safety nature of working with electricity, electrical equipment, gas or any other hazardous substance/material carries risk in deeming a person competent. Sources of evidence need to be 'rich' in nature to minimise error in judgment.

Activities associated with normal everyday work influence how/how much the data gathered will contribute to its 'richness'. Some skills are more critical to safety and operational requirements while the same skills may be more or less frequently practised. These points are raised for the assessors to consider when choosing an assessment method and developing assessment instruments. Sample assessment instruments are included for Assessors in the Assessment Guidelines of this Training Package.

Critical aspects of evidence required to demonstrate competency in this unit

9.2)

Before the critical aspects of evidence are considered all prerequisites must be met.

Evidence for competence in this unit shall be considered holistically. Each Element and associated performance criteria must be demonstrated on at least two occasions in accordance with the 'Assessment Guidelines – UEE11'. Evidence shall also comprise:

- A representative body of work performance demonstrated within the timeframes typically expected of the discipline, work function and industrial environment. In particular this shall incorporate evidence that shows a candidate is able to:

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- Implement Occupational Health and Safety workplace procedures and practices, including the use of risk control measures as specified in the performance criteria and range statement
- Apply sustainable energy principles and practices as specified in the performance criteria and range statement
- Demonstrate an understanding of the essential knowledge and associated skills as described in this unit. It may be required by some jurisdictions that RTOs provide a percentile graded result for the purpose of regulatory or licensing requirements.
- Demonstrate an appropriate level of skills enabling employment
- Conduct work observing the relevant Anti Discrimination legislation, regulations, polices and workplace procedures

- Demonstrated consistent performance across a representative range of contexts from the prescribed items below:
  - Install instrumentation and control apparatus and associated equipment as listed as described in 8) and including:

A	Reading and interpreting drawings related to and apparatus locations and tubing electrical circuit connections.
B	Placing and securing apparatus accurately
C	Connecting apparatus and associated equipment to comply with requirements.
D	Dealing with unplanned events by drawing on essential knowledge and skills to provide appropriate solutions incorporated in a holistic assessment with the above listed items

Context of and specific resources for assessment

9.3)

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This unit must be assessed as it relates to normal work practice using procedures, information and resources typical of a workplace. This should include:

- OHS policy and work procedures and instructions.
- Suitable work environment, facilities, equipment and materials to undertake actual work as prescribed by this unit.

These should be part of the formal learning/assessment environment.

Note:

Where simulation is considered a suitable strategy for assessment, the conditions must be authentic and as far as possible reproduce and replicate the workplace and be consistent with the approved industry simulation policy.

The resources used for assessment should reflect current industry practices in relation to installing instrumentation and control apparatus and associated equipment.

Method of assessment

9.4)

This unit shall be assessed by methods given in Volume 1, Part 3 'Assessment Guidelines'.

Note:

Competent performance with inherent safe working practices is expected in the Industry to which this unit applies. This requires assessment in a structured environment which is intended primarily for learning/assessment and incorporates all necessary equipment and facilities for learners to develop and demonstrate the essential knowledge and skills described in this unit.

Concurrent assessment and relationship with other units

9.5)

For optimisation of training and assessment effort, competency development in this unit may be arranged concurrently with unit:

UEENEEE107A	Use drawings, diagrams, schedules, standards, codes and specifications

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UEENEEI107A	Install instrumentation and control cabling and tubing

The critical aspects of occupational health and safety covered in unit UEENEEE101A and other discipline specific occupational health and safety units shall be incorporated in relation to this unit.

Range Statement

RANGE STATEMENT

10) This relates to the unit as a whole providing the range of contexts and conditions to which the performance criteria apply. It allows for different work environments and situations that will affect performance

This unit must be demonstrated in relation to at least four different instrumentation and control apparatus and associated equipment.

- pressure measurement apparatus and systems,
- temperature measurement apparatus and systems,
- level/density measurement apparatus and systems,
- flow measurement apparatus and systems, and
- chemical measurement apparatus and systems.

Generic terms used throughout this Vocational Standard shall be regarded as part of the Range Statement in which competency is demonstrated. The definition of these and other terms that apply are given in Volume 2, Part 2.1.

Unit Sector(s)

Not applicable.

Competency Field

Competency Field **11)**

Instrumentation and Control

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UEENEEI116A Assemble, enter and verify operating instructions in microprocessor equipped devices

Modification History

		UEENEEI116A	Assemble, enter and verify operating instructions in microprocessor equipped devices	
Release	Action	Core/Elective	Details	Points
2	Editorial	N/A	Show full pre-req chain in the unit.	
2	Editorial	N/A	In Required Skills and Knowledge, insert topic numbering.	
2	Editorial	N/A	Replace “essential knowledge and associated skills” with “required skills and knowledge”.	

Unit Descriptor

Unit Descriptor **1) Scope:**

1.1) Descriptor

This unit covers assembling and entering instructions in microprocessor-equipped devices (embedded system) with simple built-in programming function and verifying that the device operates as intended. It encompasses safe working practices, checking device installation, following written and oral instruction and procedures and completing necessary documentation.

Note:

Examples of devices are simple programmable relays, timers, temperature controllers, switches and basic detection devices for security and fire the like.

Application of the Unit

Application of the Unit **2)**

This unit is intended for competency development

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entry-level employment-based programs incorporated in approved contracts of training. It may be used to augment previously acquired competencies.

Note:

1. Compliance with permits may be required in various jurisdictions and typically relates to the operation of plant, machinery and equipment such as elevating work platforms, powder operated fixing tools, power operated tools, vehicles, road signage and traffic control, lifting equipment. Permits may also be required for some work environments such as confined spaces, working aloft, near live electrical apparatus, site rehabilitation.

2. Compliance may be required in various jurisdictions relating to currency in First Aid, confined space, lifting and risk safety measures.

Licensing/Regulatory Information

License to practice **3)**

The skills and knowledge described in this unit do not require a license to practice in the workplace. However, practice in this unit is subject to regulations directly related to occupational health and safety and where applicable contracts of training such as apprenticeships.

Pre-Requisites

Prerequisite Unit(s) **4)**

Competencies **4.1)**

Granting competency in this unit shall be made only after competency in the following unit(s) has/have been confirmed.

UEENEEE101A	Apply Occupational Health Safety regulations, codes and practices in the workplace

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Literacy and numeracy skills **4.2)**

Participants are best equipped to achieve competency in this unit if they have reading, writing and numeracy skills indicated by the following scales. Description of each scale is given in Volume 2, Part 3 'Literacy and Numeracy'

Reading 3 Writing 3 Numeracy 3

Employability Skills Information

Employability Skills **5)**

The required outcomes described in this unit of competency contain applicable facets of Employability Skills. The Employability Skills Summary of the qualification in which this unit of competency is packaged will assist in identifying Employability Skill requirements.

Elements and Performance Criteria Pre-Content

6) Elements describe the essential outcomes of a competency standard unit

Performance Criteria describe the required performance needed to demonstrate achievement of the element. Assessment of performance is to be consistent with the Evidence Guide.

Elements and Performance Criteria

ELEMENT	PERFORMANCE CRITERIA
1 Prepare to assemble and enter operating instructions.	1.1 OHS procedures for a given work area are identified, obtained and understood through established routines and procedures.
	1.2 Established OHS risk control measures and procedures are followed in preparation for the work.

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ELEMENT	PERFORMANCE CRITERIA	
	1.3	Safety hazards that have not previously been identified are reported and advice on risk control measures is sought from the work supervisor.
	1.4	Work supervisor or customers are consulted to determine which functions of the device are to be use and the parameter of each
	1.5	Tools, equipment and testing devices needed to carry out the work are obtained and checked for correct operation and safety.
	1.6	Device installation is checked for compliance with job specification and regulations where they apply.
2 Assemble and enter operating instructions.	2.1	Established OHS risk control measures and procedures for carrying out the work are followed.
	2.2	Circuits/machines/plant are checked as being isolated where necessary in strict accordance OHS requirements and procedures.
	2.3	The required status of each function of the device is entered and their parameters set in accordance with manufacturer programming instructions.
	2.4	Entered data are checked as meeting those specified by the work supervisor or customer.
	2.5	Procedures for referring non-routine events to immediate supervisor for directions are followed.
	2.6	Tools, equipment and testing devices needed to carry out the work are obtained and checked for correct operation and safety.
3 Test device operation and report.	3.1	Device operation is tested in strict accordance OHS requirements and procedures.
	3.2	Operating anomalies are identified and corrected in accordance with established routines.
	3.3	OHS work completion risk control measures and

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ELEMENT	PERFORMANCE CRITERIA
	procedures are followed.
	3.4 Work site is cleaned and made safe in accordance with established procedures.
	3.5 Work completion is reported and appropriate person(s) notified in accordance with established routines.

Required Skills and Knowledge

REQUIRED SKILLS AND KNOWLEDGE

8) This describes the required skills and knowledge and their level, required for this unit.

Evidence shall show that knowledge has been acquired of safe working practices and entering and verifying operating instruction in basic microprocessor equipped devices.

All knowledge and skills detailed in this unit should be contextualised to current industry practices and technologies.

KS01-EI116A Microprocessor equipped devices

Evidence shall show an understanding of microprocessor equipped devices to an extent indicated by the following aspects:

T1 Overview of digital controllers

- types
- block diagram of controller
- applications
- terms

T2 Controller input and output equipment

- input sensors (transducers)
- current loop concepts
- output current and voltage ratings
- supplementary solid state relays/ contactors

T3 Installation of controllers

- types of input sensors
- wiring

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REQUIRED SKILLS AND KNOWLEDGE

- mounting techniques
- terminal types
- output current protection

T4 Configuration and digital controller set-up

- operator interfaces
- manufacturer's data
- testing

Evidence Guide

EVIDENCE GUIDE

9) This provides essential advice for assessment of the unit and must be read in conjunction with the performance criteria and the range statement of the unit and the Training Package Assessment Guidelines.

The Evidence Guide forms an integral part of this unit. It must be used in conjunction with all parts of this unit and performed in accordance with the Assessment Guidelines of this Training Package.

Overview of Assessment **9.1)**

Longitudinal competency development approaches to assessment, such as Profiling, require data to be reliably gathered in a form that can be consistently interpreted over time. This approach is best utilised in Apprenticeship programs and reduces assessment intervention. It is the industry-preferred model for apprenticeships. However, where summative (or final) assessment is used it is to include the application of the competency in the normal work environment or, at a minimum, the application of the competency in a realistically simulated work environment. It is recognised that, in some circumstances, assessment in part or full can occur outside the workplace. However, it must be in accordance with industry and regulatory policy.

Methods chosen for a particular assessment will be influenced by various factors. These include the extent of the assessment, the most effective locations for the assessment activities to take place, access to physical resources, additional safety measures that may be required and the critical nature of the competencies being

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assessed.

The critical safety nature of working with electricity, electrical equipment, gas or any other hazardous substance/material carries risk in deeming a person competent. Sources of evidence need to be 'rich' in nature to minimise error in judgment.

Activities associated with normal everyday work have a bearing on the decision as to how much and how detailed the data gathered will contribute to its 'richness'. Some skills are more critical to safety and operational requirements while the same skills may be more or less frequently practised. These points are raised for the assessors to consider when choosing an assessment method and developing assessment instruments. Sample assessment instruments are included for Assessors in the Assessment Guidelines of this Training Package.

Critical aspects of evidence required to demonstrate competency in this unit

9.2)

Before the critical aspects of evidence are considered all prerequisites shall be met.

Evidence for competence in this unit shall be considered holistically. Each element and associated performance criteria shall be demonstrated on at least two occasions in accordance with the 'Assessment Guidelines – UEE11. Evidence shall also comprise:

- A representative body of work performance demonstrated within the timeframes typically expected of the discipline, work function and industrial environment. In particular this shall incorporate evidence that shows a candidate is able to:
  - Implement Occupational Health and Safety workplace procedures and practices, including the use of risk control measures as specified in the performance criteria and range statement
  - Apply sustainable energy principles and practices as specified in the performance criteria and range statement
  - Demonstrate an understanding of the required skills and knowledge as described in this unit. It may be required by some jurisdictions that RTOs provide a percentile graded result for the purpose of regulatory or licensing requirements.

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- Demonstrate an appropriate level of skills enabling employment
- Conduct work observing the relevant Anti Discrimination legislation, regulations, polices and workplace procedures

- Demonstrated consistent performance across a representative range of contexts from the prescribed items below:
  - Enter and verify operating instructions in microprocessor equipped devices as described in 10) and including:

A Understanding required operating functions and parameters.

B Identifying non-compliance conditions of device installation.

C Entering functions and parameters correctly.

D Correcting programming anomalies.

E Testing and verify device operation.

F Dealing with unplanned events by drawing on required skills and knowledge to provide appropriate solutions incorporated in a holistic assessment with the above listed items.

Note:

Successful completion of relevant vendor training may be used to contribute to evidence on which competency is deemed. In these cases the alignment of outcomes of vendor training with performance criteria and critical aspects of evidence shall be clearly identified.

Context of and specific resources for assessment

9.3)

This unit should be assessed as it relates to normal work practice using procedures, information and resources typical of a workplace. This should include:

- OHS policy and work procedures and instructions.
- Suitable work environment, facilities, equipment and materials to undertake actual work as prescribed in this unit.

These should be used in the formal learning/assessment

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environment.

Note:

Where simulation is considered a suitable strategy for assessment, conditions for assessment must be authentic and as far as possible reproduce and replicate the workplace and be consistent with the approved industry simulation policy.

The resources used for assessment should reflect current industry practices in relation to enter and verifying operating instructions in microprocessor equipped devices.

Method of assessment

9.4)

This unit shall be assessed by methods given in Volume 1, Part 3 ‘Assessment Guidelines’.

Note:

Competent performance with inherent safe working practices is expected in the Industry to which this unit applies. This requires assessment in a structured environment which is primarily intended for learning/assessment and incorporates all necessary equipment and facilities for learners to develop and demonstrate the required skills and knowledge described in this unit.

Concurrent assessment and relationship with other units

9.5)

There are no concurrent assessment recommendations for this unit.

Range Statement

RANGE STATEMENT

10) This relates to the unit as a whole providing the range of contexts and conditions to which the performance criteria apply. It allows for different work environments and situations that will affect performance.

This unit shall be demonstrated in relation to assembling, entering and verifying operating instruction in at least two types of microprocessor equipped devices with built-in icon-based programmable functions such as programmable relays, timers,

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RANGE STATEMENT

temperature controllers, detection devices for security and fire.

Generic terms used throughout this Vocational Standard shall be regarded as part of the Range Statement in which competency is demonstrated. The definition of these and other terms that apply are given in Volume 2, Part 2.1.

Unit Sector(s)

Not applicable.

Competency Field

Competency Field **11)**

Instrumentation and Control

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UEENEEI150A Develop, enter and verify discrete control programs for programmable controllers

Modification History

		UEENEEI150A	Develop, enter and verify discrete control programs for programmable controllers	
Release	Action	Core/Elective	Details	Points
2	Editorial	N/A	In Pre-requisites, delete “For the full prerequisite chain details for this unit please refer to Table 2 in Volume 1, Part 2”.	
2	Editorial	N/A	In Required Skills and Knowledge, insert topic numbering.	
2	Editorial	N/A	Replace “essential knowledge and associated skills” with “required skills and knowledge”.	

Unit Descriptor

Unit Descriptor

1) Scope:

1.1) Descriptor

This unit covers development, installation and testing of programs for programmable controllers (PLC) for a system requiring discrete control functions. It encompasses working safely, applying knowledge of control systems, control system development methods, using ladder diagrams/statement list/function block diagram instruction sets, following written instructions and documenting program development and testing activities.

Application of the Unit

Application of the Unit

2)

This unit is intended to augment formally-acquired competencies. It is suitable for employment-based

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programs under an approved contract of training.

Note:

1. Compliance with permits may be required in various jurisdictions and typically relates to the operation of plant, machinery and equipment such as elevating work platforms, powder operated fixing tools, power operated tools, vehicles, road signage and traffic control, lifting equipment. Permits may also be required for some work environments such as confined spaces, working aloft, near live electrical apparatus, site rehabilitation.

2. Compliance may be required in various jurisdictions relating to currency in First Aid, confined space, lifting and risk safety measures.

Licensing/Regulatory Information

License to practice **3)**

The skills and knowledge described in this unit do not require a license to practice in the workplace. However, practice in this unit is subject to regulations directly related to occupational health and safety and where applicable contracts of training such as apprenticeships.

Pre-Requisites

Prerequisite Unit(s) **4)**

Competencies **4.1)**

Granting of competency in this unit shall be made only after competency in the following unit(s) has/have been confirmed.

Unit Code	Unit Title
UEENEEE101A	Apply Occupational Health and Safety regulations, codes and practices in the workplace

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Literacy and numeracy skills **4.2)**

Participants are best equipped to achieve competency in this unit if they have reading, writing and numeracy skills indicated by the following scales. Description of each scale is given in Volume 2, Part 3 'Literacy and Numeracy'

Reading 4 Writing 4 Numeracy 4

Employability Skills Information

Employability Skills **5)**

The required outcomes described in this unit of competency contain applicable facets of Employability Skills. The Employability Skills Summary of the qualification in which this unit of competency is packaged will assist in identifying Employability Skill requirements.

Elements and Performance Criteria Pre-Content

6) Elements describe the essential outcomes of a competency standard unit

Performance Criteria describe the required performance needed to demonstrate achievement of the element. Assessment of performance is to be consistent with the Evidence Guide.

Elements and Performance Criteria

ELEMENT	PERFORMANCE CRITERIA
1 Prepare to develop enter and verify program.	1.1 OHS procedures for a given work area are identified, obtained and understood through established routines and procedures.
	1.2 Established OHS risk control measures and procedures are followed in preparation for the work.

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ELEMENT	PERFORMANCE CRITERIA	
	1.3	Safety hazards that have not previously been identified are reported and advice on risk control measures is sought from the work supervisor.
	1.4	Control system scenario is determined from job specifications of the process/plant/machine to be controlled, and through consultation with appropriate person(s).
	1.5	Equipment, software and testing devices needed to carry out the work are obtained and checked for correct operation and safety.
	1.6	Installation of programmable controller is checked for compliance with regulations and job specification.
2 Develop control system and enter and test program.	2.1	Established OHS risk control measures and procedures for carrying out the work are followed.
	2.2	Circuits/machines/plant are checked as being isolated where necessary in strict accordance OHS requirements and procedures.
	2.3	Control solutions are developed and documented based on the specified control mode and using acceptable methods for designing control systems.
	2.4	Developed control system is converted to an appropriate form, such as flow, state and ladder diagrams(See Note 1)
	2.5	Program is entered into the programmable control using a personal computer and appropriate software.
	2.6	Entered instructions and settings are tested as meeting those specified in by the control system scenario.
	2.7	Appropriate methods and tools are used to

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ELEMENT	PERFORMANCE CRITERIA	
		test control systems and operating faults and anomalies are identified and rectified. (See Note 2)
	2.8	Methods for dealing with unexpected situations are selected on the basis of safety and specified work outcomes.
3 Verify, document and report programming activities.	3.1	OHS work completion risk control measures and procedures are followed.
	3.2	Program is transferred from a programmable controller to an external medium for storage. (See Note 3)
	3.3	Control system specification and program are documented in accordance with established procedures.
	3.4	Work completion is reported and appropriate personnel notified in accordance with established procedures.

Note.

1. Example of control functions are derived timers (off delay, self resetting, constant duty cycle), reversible counters, cascading timers, cascading counters, combining timers and counters, internal relays/flags/markers, latching relays (set/reset), jump instructions, master control instructions, bit shift registers, scan time considerations, one shot, retentive (power fail) functions, simple step sequence instructions

2. Examples of control system testing methods and tools are monitor mode as an aid to fault finding, inbuilt hardware/software diagnostics and use of error codes.

3. Examples of storage mediums are IC storage, hard disks, servers.

Required Skills and Knowledge

REQUIRED SKILLS AND KNOWLEDGE

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REQUIRED SKILLS AND KNOWLEDGE

8) This describes the required skills and knowledge and their level, required for this unit.

Evidence shall show that knowledge has been acquired of safe working practices and developing, entering and verifying discrete control programs for programmable logic controllers.

All knowledge and skills detailed in this unit should be contextualised to current industry practices and technologies.

KS01-EI150A Programmable controller

Evidence shall show an understanding of programmable controller to an extent indicated by the following aspects:

T1. PLC Introduction encompassing:

- Evolution of the programmable controller and applications
- Relay control, static logic control and programmable control
- Programmable controller block diagram (Inputs and Outputs)
- Programmable controller advantages
- Programmable controller symbols
- Programmable controller functions
- Numbering systems start-up procedures
- Programming inputs and outputs
- Operation of programmable controller inputs
- PLC operation: scan cycle
- Basic programming

T2. Types of PC programs encompassing:

- Ladder diagrams
- Basic Programming
- Program modification
- Ladder diagram development
- Connecting the programmable controller.

T3. Programming Timers encompassing:

- Purpose of timers
- Timer instructions
- On-delay timer instruction
- Off-delay timer instruction
- Programming timers
- Retentive and non-retentive timers
- Cascading timers
- The self-resetting timer
- Monitoring timers

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REQUIRED SKILLS AND KNOWLEDGE

- Circuit conversion

T4. Programming Counters encompassing:

- Counter instructions
- Retentive and non-retentive counter
- Programming counters
- Up/down counters
- Self resetting counter
- Cascading counters
- Circuit conversion

T5. Program Storage encompassing:

- PLC terms
- Memory
- Using the PROM pack
- Printing ladder diagrams

T6. PLC Input and Output Modules encompassing:

- Purpose of modules

T7 PLC input modules:

- dry contact input modules;
- AC input modules, DC input modules;
- Analog input modules

T8 Output modules:

- relay output;
- Triac output;
- transistor output;
- analog output modules

T9. PLC Installation Requirements encompassing:

- Installation precaution
- Safety systems
- AS/NZS requirements
- Mounting the PLC
- Installation documentation
- Routing signal and power cables
- Locating PLCs and I/O
- Earthing Requirements

T10. Master Control encompassing:

- Master control relay
- Master control relay ladder diagram

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REQUIRED SKILLS AND KNOWLEDGE

- Programming master control relays

T11. Jump Function encompassing:

- Jump function
- Jump function ladder diagram
- Programming jump functions

T12. The Shift Register encompassing:

- Purpose of Registers
- The shift register
- Shift register operation
- Clock input
- Shift register requirements
- Programming shift registers

T13. The Step Sequencer encompassing:

- Step Sequencers
- Step sequencer operation
- Clock input
- Step Sequencer requirements
- Programming step sequencer

T12. PLC Diagnostics and Fault Finding encompassing:

- PLC Fault Finding
- Controller Status
- I/O Faults
- Program Faults

Evidence Guide

EVIDENCE GUIDE

9) This provides essential advice for assessment of the unit and must be read in conjunction with the performance criteria and the range statement of the unit and the Training Package Assessment Guidelines.

The Evidence Guide forms an integral part of this unit. It must be used in conjunction with all parts of this unit and performed in accordance with the Assessment Guidelines of this Training Package.

Overview of 9.1)

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Assessment

Longitudinal competency development approaches to assessment, such as Profiling, require data to be reliably gathered in a form that can be consistently interpreted over time. This approach is best utilised in Apprenticeship programs and reduces assessment intervention. It is the industry-preferred model for apprenticeships. However, where summative (or final) assessment is used it is to include the application of the competency in the normal work environment or, at a minimum, the application of the competency in a realistically simulated work environment. It is recognised that, in some circumstances, assessment in part or full can occur outside the workplace. However, it must be in accordance with industry and regulatory policy.

Methods chosen for a particular assessment will be influenced by various factors. These include the extent of the assessment, the most effective locations for the assessment activities to take place, access to physical resources, additional safety measures that may be required and the critical nature of the competencies being assessed.

The critical safety nature of working with electricity, electrical equipment, gas or any other hazardous substance/material carries risk in deeming a person competent. Sources of evidence need to be 'rich' in nature to minimise error in judgment.

Activities associated with normal everyday work have a bearing on the decision as to how much and how detailed the data gathered will contribute to its 'richness'. Some skills are more critical to safety and operational requirements while the same skills may be more or less frequently practised. These points are raised for the assessors to consider when choosing an assessment method and developing assessment instruments. Sample assessment instruments are included for Assessors in the Assessment Guidelines of this Training Package.

Critical aspects of evidence required to demonstrate competency in this unit

9.2)

Before the critical aspects of evidence are considered all prerequisites shall be met.

Evidence for competence in this unit shall be considered holistically. Each element and associated performance criteria

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shall be demonstrated on at least two occasions in accordance with the 'Assessment Guidelines – Evidence shall also comprise:

- A representative body of work performance demonstrated within the timeframes typically expected of the discipline, work function and industrial environment. In particular this shall incorporate evidence that shows a candidate is able to:
  - Implement Occupational Health and Safety workplace procedures and practices, including the use of risk control measures as specified in the performance criteria and range statement
  - Apply sustainable energy principles and practices as specified in the performance criteria and range statement
  - Demonstrate an understanding of the required skills and knowledge as described in this unit. It may be required by some jurisdictions that RTOs provide a percentile graded result for the purpose of regulatory or licensing requirements.
  - Demonstrate an appropriate level of skills enabling employment
  - Conduct work observing the relevant Anti Discrimination legislation, regulations, polices and workplace procedures
- Demonstrated consistent performance across a representative range of contexts from the prescribed items below:
  - Develop, enter and verify programs for programmable controllers as described in 8) and including:

A	Developing a control system solution to the required operating functions and parameters.
B	Identifying non-compliance conditions of device installation.
C	Converting control system to a PLC program.
D	Entering programming functions and parameters correctly.
E	Transferring programs to a PLC.
F	Correcting programming anomalies.
G	Testing and verify control system operation.
H	Transferring program to external storage.

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I	Documenting control system and programming clearly.
J	Dealing with unplanned events by drawing on required skills and knowledge to provide appropriate solutions incorporated in a holistic assessment with the above listed items.

Note:

Successful completion of relevant vendor training may be used to contribute to evidence on which competency is deemed. In these cases the alignment of outcomes of vendor training with performance criteria and critical aspects of evidence shall be clearly identified.

Context of and specific resources for assessment **9.3)**

This unit should be assessed as it relates to normal work practice using procedures, information and resources typical of a workplace. This should include:

- OHS policy and work procedures and instructions.
- Suitable work environment, facilities, equipment and materials to undertake actual work as prescribed in this unit.

These should be used in the formal learning/assessment environment.

Note:

Where simulation is considered a suitable strategy for assessment, conditions for assessment must be authentic and as far as possible reproduce and replicate the workplace and be consistent with the approved industry simulation policy.

The resources used for assessment should reflect current industry practices in relation to developing, entering and verifying programs for programmable logic controllers using ladder instrument set.

Method of assessment **9.4)**

This unit shall be assessed by methods given in Volume 1, Part 3 ‘Assessment Guidelines’.

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Note:

Competent performance with inherent safe working practices is expected in the Industry to which this unit applies. This requires assessment in a structured environment which is primarily intended for learning/assessment and incorporates all necessary equipment and facilities for learners to develop and demonstrate the required skills and knowledge described in this unit.

Concurrent assessment and relationship with other units

9.5)

There are no concurrent assessment recommendations for this unit.

Range Statement

RANGE STATEMENT

10) This relates to the unit as a whole providing the range of contexts and conditions to which the performance criteria apply. It allows for different work environments and situations that will affect performance.

This unit shall be demonstrated in relation to developing, entering and verifying programs for programmable logic controllers. The program shall include at least five of the following functions/controls:

- Derived timers (off delay)
- Self resetting
- Constant duty cycle
- Reversible counters
- Cascading timers
- Cascading counters
- Combining timers and counters
- Internal relays/flags/markers
- Latching relays (set/reset)
- Jump instructions
- Master control instructions
- Bit shift registers
- Scan time considerations
- One shot

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RANGE STATEMENT

- Retentive (power fail) functions
- Simple step sequence instructions

Generic terms used throughout this Vocational Standard shall be regarded as part of the Range Statement in which competency is demonstrated. The definition of these and other terms that apply are given in Volume 2, Part 2.1.

Unit Sector(s)

Not applicable.

Competency Field

Competency Field **11)**

Instrumentation and Control

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UEENEEK101A Maintain safety and tidiness of remote area power supply systems

Modification History

Not applicable.

Unit Descriptor

Unit Descriptor **1) Scope:**

1.1) Descriptor

This unit covers maintaining safety of remote area power supply (RAPS) system by ensuring that only RAPS equipment is present and is in its allotted place and that the system is free of litter. It encompasses working safely, regularly checking systems, cleaning techniques and reporting safety issues.

Application of the Unit

Application of the Unit **2)**

This unit is intended primarily for indigenous persons seeking qualifications in RAPS system servicing. The unit may also be applied to work entry qualifications in renewable energy service work in general and be used in school-based vocational programs.

Licensing/Regulatory Information

License to practice **3)**

The skills and knowledge described in this unit do not require a license to practice in the workplace. However, practice in this unit is subject to regulations directly related to occupational health and safety and contracts of training such as new apprenticeships.

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Pre-Requisites

Prerequisite Unit(s) **4)**

Competencies **4.1)**

Granting competency in this unit shall be made only after competency in the following unit(s) has/have been confirmed.

UEENEEE101A	Apply Occupational Health Safety regulations, codes and practices in the workplace
UEENEEK102A	Work safely with remote area power supply systems

Literacy and numeracy skills **4.2)**

Participants are best equipped to achieve competency in this unit if they have reading, writing and numeracy skills indicated by the following scales. Description of each scale is given in Volume 2, Part 3 ‘Literacy and Numeracy’

Reading	3	Writing	3	Numeracy	3

Employability Skills Information

Employability Skills **5)**

The required outcomes described in this unit of competency contain applicable facets of Employability Skills. The Employability Skills Summary of the qualification in which this unit of competency is packaged will assist in identifying Employability Skill requirements.

Elements and Performance Criteria Pre-Content

6) Elements describe the essential outcomes of a	Performance Criteria describe the required performance needed to demonstrate achievement of the element.

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competency standard unit	Assessment of performance is to be consistent with the Evidence Guide.

Elements and Performance Criteria

ELEMENT	PERFORMANCE CRITERIA
1 Prepare to maintain safety and tidiness of RAPS system	1.1 OHS procedures for a given work area are identified, obtained and understood through established routines and procedures
	1.2 Established OHS risk control measures and procedures in preparation for the work are followed.
	1.3 Safety hazards which have not previously been identified are reported and advice on risk control measures is sought from the work supervisor.
	1.4 The nature and location of the RAPS system is obtained from work schedule and supervisor to establish the scope of work to be undertaken.
	1.5 Advice is sought from the work supervisor to ensure the work is coordinated effectively with fellow workers and the local community.
	1.6 Tools and equipment needed to carry out the cleaning work are obtained and checked for correct operation and safety
2 Maintain safety and tidiness of RAPS system	2.1 Established OHS risk control measures and procedures for carrying out the work are followed.
	2.2 The need to test or measure live is determined in strict accordance with OHS requirements and when necessary conducted within established safety procedures.
	2.3 Circuits/machines/system are checked as being isolated where necessary in strict accordance OHS requirements and procedures.
	2.4 Routine procedures are used to clean RAPS system and area.

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ELEMENT	PERFORMANCE CRITERIA	
	2.5	Cleaning is carried out efficiently without waste of materials and energy or damage to apparatus, circuits, the surrounding environment or services.
	2.6	Routine quality checks are carried out in accordance with work instructions.
3 Complete work and report	3.1	OHS risk control work completion measures and procedures are followed.
	3.2	Procedures for referring cleaning and tidiness issues to the local community are followed.
	3.3	Completion of cleaning work and issues are reported to work supervisor in accordance with established routines.

Required Skills and Knowledge

REQUIRED SKILLS AND KNOWLEDGE

8) This describes the essential skills and knowledge and their level, required for this unit.

Evidence must show that knowledge has been acquired of safe working practices and maintaining safety and tidiness of remote area power supply (RAPS) systems

All knowledge and skills detailed in this unit should be contextualised to current industry practices and technologies.

KS01-EK101A RAPS plant area cleaning

Evidence shall show an understanding of cleaning and maintaining remote area power supply (RAPS) systems to an extent indicated by the following aspects:

- Needs for a clean and tidy plant area
- RAPS system components and associated equipment and their location within the plant area
- manual fuel pump if available
- Plant cleaning techniques:
  - Fuel and oil
  - acid spills;

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REQUIRED SKILLS AND KNOWLEDGE

- removal of dust, insects, spiders, animals
- removal of non-RAPS equipment
- Technique for reporting and dealing with cleaning issues.

Evidence Guide

EVIDENCE GUIDE

9) This provides essential advice for assessment of the unit and must be read in conjunction with the performance criteria and the range statement of the unit and the Training Package Assessment Guidelines.

The Evidence Guide forms an integral part of this unit. It must be used in conjunction with all parts of this unit and performed in accordance with the Assessment Guidelines of this Training Package.

Overview of Assessment **9.1)**

Longitudinal competency development approaches to assessment, such as Profiling, require data to be reliably gathered in a form that can be consistently interpreted over time. This approach is best utilised in Apprenticeship programs and reduces assessment intervention. It is the industry-preferred model for apprenticeships. However, where summative (or final) assessment is used it is to include the application of the competency in the normal work environment or, at a minimum, the application of the competency in a realistically simulated work environment. In some circumstances, assessment in part or full can occur outside the workplace. However, it must be in accordance with industry and regulatory policy.

Methods chosen for a particular assessment will be influenced by various factors. These include the extent of the assessment, the most effective locations for the assessment activities to take place, access to physical resources, additional safety measures that may be required and the critical nature of the competencies being assessed.

The critical safety issues inherent in working with electricity, electrical equipment, gas or any other hazardous substance/material present a challenge for those determining competence. Sources of evidence need to be ‘rich’ in nature to

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minimise error in judgment.

Activities associated with normal everyday work have a bearing on the decision as to how much and how detailed the data gathered will contribute to its 'richness'. Some skills are more critical to safety and operational requirements while the same skills may be more or less frequently practised. These points are raised for the assessors to consider when choosing an assessment method and developing assessment instruments. Sample assessment instruments are included for Assessors in the Assessment Guidelines of this Training Package.

Critical aspects of evidence required to demonstrate competency in this unit

9.2)

Before the critical aspects of evidence are considered all prerequisites must be met.

Evidence for competence in this unit must be considered holistically. Each element and associated performance criteria must be demonstrated on at least two occasions in accordance with the 'Assessment Guidelines – UEE11'. Evidence must also comprise:

- A representative body of work performance demonstrated within the timeframes typically expected of the discipline, work function and industrial environment. In particular this must incorporate evidence that shows a candidate is able to:
  - Implement Occupational Health and Safety workplace procedures and practices including the use of risk control measures as specified in the performance criteria and range statement
  - Apply sustainable energy principles and practices as specified in the performance criteria and range statement
  - Demonstrate an understanding of the essential knowledge and associated skills as described in this unit. It may be required by some jurisdictions that RTOs provide a percentile graded result for the purpose of regulatory or licensing requirements.
  - Demonstrate an appropriate level of skills enabling employment
  - Conduct work observing the relevant Anti Discrimination legislation, regulations, polices and workplace procedures

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- Demonstrated consistent performance across a representative range of contexts from the prescribed items below:
  - Maintain safety and tidiness of remote area power supply systems as described in 8) and including:

A	Removing non-RAPS equipment
B	Safely removing insects, spiders and any animals
C	Safely removing dust and dirt from floors and equipment
D	Identifying and reporting at least two safety issues
E	Dealing with unplanned events by drawing on essential knowledge and skills to provide appropriate solutions incorporated in a holistic assessment with the above listed items

Context of and specific resources for assessment

9.3)

This unit should be assessed as it relates to normal work practice using procedures, information and resources typical of a workplace. This should include:

- OHS policy and work procedures and instructions.
- Suitable work environment, facilities, equipment and materials to undertake actual work as prescribed by this unit.

These should be part of the formal learning/assessment environment.

Note:

Where simulation is considered a suitable strategy for assessment, conditions must be authentic and as far as possible reproduce and replicate the workplace and be consistent with the approved industry simulation policy.

The resources used for assessment should reflect current industry practices in relation to maintaining safety and tidiness of remote area power supply systems.

Method of

9.4)

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assessment

This unit shall be assessed by methods given in Volume 1, Part 3 'Assessment Guidelines'.

Note:
Competent performance with inherent safe working practices is expected in the Industry to which this unit applies. This requires assessment in a structured environment which is intended primarily for learning/assessment and incorporates all necessary equipment and facilities for learners to develop and demonstrate the essential knowledge and skills described in this unit.

Concurrent assessment and relationship with other units

9.5) There are no concurrent assessment recommendations for this unit.

For optimisation of training and assessment effort, competence in this unit may be assessed concurrently with units UEENEEE101A Apply Occupational Health Safety regulations, codes and practices in the workplace

Range Statement

RANGE STATEMENT

10) This relates to the unit as a whole providing the range of contexts and conditions to which the performance criteria apply. It allows for different work environments and situations that will affect performance.

This unit must be demonstrated in relation to least two different RAPS systems incorporating a battery bank and at least two of the following:

- Generator set
- Photo voltaic array
- RAP system
- Wind generator

Generic terms used throughout this Vocational Standard shall be regarded as part of the Range Statement in which competency is demonstrated. The definition of these and other terms that apply are given in Volume 2, Part 2.1.

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Unit Sector(s)

Not applicable.

Competency Field

Competency Field **11)**

Renewable and Sustainable Energy

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UEENEEK102A Work safely with remote area power supply systems

Modification History

Not applicable.

Unit Descriptor

Unit Descriptor **1) Scope:**

1.1) Descriptor

This unit covers safety practices for working on remote area power supply (RAPS) systems. It encompasses identifying safety hazards, using risks control measures and following routine procedures for prescribed system maintenance.

Note:
Components of this unit are included in the critical aspects of evidence in each applicable unit to ensure that OHS practices are demonstrated as they apply to RAPS system servicing work functions and situations

Application of the Unit

Application of the Unit **2)**

This unit is intended primarily for indigenous persons seeking qualifications in RAPS system servicing. The unit may also be applied to work entry qualifications in renewable energy service work in general and be used in school-based vocational programs.

Licensing/Regulatory Information

License to practice **3)**

The skills and knowledge described in this unit do not require a license to practice in the workplace. However,

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License to practice **3)**

practice in this unit is subject to regulations directly related to occupational health and safety and contracts of training such as new apprenticeships

Pre-Requisites

Prerequisite Unit(s) **4)**

Competencies **4.1)**

Granting competency in this unit shall be made only after competency in the following unit(s) has/have been confirmed

UEENEEE101A	Apply Occupational Health Safety regulations, codes and practices in the workplace

Literacy and numeracy skills **4.2)**

Participants are best equipped to achieve competency in this unit if they have reading, writing and numeracy skills indicated by the following scales. Description of each scale is given in Volume 2, Part 3 ‘Literacy and Numeracy’

Reading 3 Writing 3 Numeracy 3

Employability Skills Information

Employability Skills **5)**

The required outcomes described in this unit of competency contain applicable facets of Employability Skills. The Employability Skills Summary of the qualification in which this unit of competency is packaged will assist in identifying Employability Skill requirements.

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Elements and Performance Criteria Pre-Content

6) Elements describe the essential outcomes of a competency standard unit	Performance Criteria describe the required performance needed to demonstrate achievement of the element. Assessment of performance is to be consistent with the Evidence Guide.

Elements and Performance Criteria

ELEMENT		PERFORMANCE CRITERIA	
1	Prepare to enter a RAPS system	1.1	Instruction in hazards and risk control measures for RAPS systems maintenance are identified, obtained and understood.
		1.2	System access permit is obtained from work supervisor.
		1.3.	Preparations for electrical and non-electrical isolation are made to prevent creation of hazards
		1.4	Tools and equipment needed for the work are checked for safety and correct functionality according to established safety routines.
2	Apply safe working practices in RAPS system area.	2.1	Workplace procedures and work instructions for controlling risk are followed accurately.
		2.2	Workplace procedures for dealing safe working practices in RAPS system are followed according to prescribed work procedures.
		2.3	Circuits/machines/system are checked as being isolated where necessary in strict accordance OHS requirements and procedures.
		2.4	Routine procedures are used to apply safe working practices in RAPS system and area.
		2.5	Safe working practices are carried out efficiently without waste of materials and energy or damage to apparatus, circuits, the surrounding environment or services.
		2.6	Routine quality checks are carried out in accordance with work instructions.
3.	Follow workplace procedures for hazard identification and risk control in RAPS system areas	3.1	Hazards are identified and prescribed control measures implemented and monitored through active participation in the consultation process with employer, other employees and local community.

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ELEMENT	PERFORMANCE CRITERIA
	3.2 Hazards in the work are recognised and reported to work supervisor personnel according to established procedures.
	3.3 OHS records of incidents are completed in accordance with regulatory requirements and established procedures
	3.4 Workplace instructions and training are followed accurately within established procedures.

Required Skills and Knowledge

REQUIRED SKILLS AND KNOWLEDGE

8) This describes the essential skills and knowledge and their level, required for this unit.

Evidence must show that knowledge has been acquired of safe working practices and working safely with remote area power supply (RAPS) systems.

All knowledge and skills detailed in this unit should be contextualised to current industry practices and technologies.

KS01-EK102A Remote area power supply safe working practice

Evidence shall show an understanding of RAPS safe working practices to an extent indicated by the following aspects:

General safety encompassing:

- General safety
- Risk assessment
- Personal protective equipment
- OHS procedures

RAPS safety and risk assessment encompassing:

- Types of hazards in and around remote area power supplies

Note: In addition to the safety hazards found in most workplace RAPS systems are likely to have the hazards related to electricity supplied from more than one source, rotating machines, fuels and oils, exhaust fumes, and acids and flammable gases from batteries.

- Measures for dealing with hazards in and around remote area power supplies

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REQUIRED SKILLS AND KNOWLEDGE

- Purpose and methods for isolation and de-energisation of power supplies

Correct isolation and de-energisation procedures encompassing:

- Processes for preventing generator from automatically starting
- Isolating photo voltaic arrays,
- Isolating wind driven generators,
- Isolating battery
- Isolating inverter power sources

Safety signage encompassing:

- Types of signs
- Location
- Condition
- Suitability

Access to system encompassing:

- Methods for limiting access to plant areas

Reporting

Evidence Guide

EVIDENCE GUIDE

9) This provides essential advice for assessment of the unit and must be read in conjunction with the performance criteria and the range statement of the unit and the Training Package Assessment Guidelines.

The Evidence Guide forms an integral part of this unit. It must be used in conjunction with all parts of this unit and performed in accordance with the Assessment Guidelines of this Training Package.

Overview of Assessment **9.1)**

Longitudinal competency development approaches to assessment, such as Profiling, require data to be reliably gathered in a form that can be consistently interpreted over time. This approach is best utilised in Apprenticeship programs and reduces assessment intervention. It is the industry-preferred model for apprenticeships.

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However, where summative (or final) assessment is used it is to include the application of the competency in the normal work environment or, at a minimum, the application of the competency in a realistically simulated work environment. In some circumstances, assessment in part or full can occur outside the workplace. However, it must be in accordance with industry and regulatory policy.

Methods chosen for a particular assessment will be influenced by various factors. These include the extent of the assessment, the most effective locations for the assessment activities to take place, access to physical resources, additional safety measures that may be required and the critical nature of the competencies being assessed.

The critical safety issues inherent in working with electricity, electrical equipment, gas or any other hazardous substance/material present a challenge for those determining competence. Sources of evidence need to be 'rich' in nature to minimise error in judgment.

Activities associated with normal everyday work have a bearing on the decision as to how much and how detailed the data gathered will contribute to its 'richness'. Some skills are more critical to safety and operational requirements while the same skills may be more or less frequently practised. These points are raised for the assessors to consider when choosing an assessment method and developing assessment instruments. Sample assessment instruments are included for Assessors in the Assessment Guidelines of this Training Package.

Critical aspects of evidence required to demonstrate competency in this unit

9.2)

Before the critical aspects of evidence are considered all prerequisites must be met.

Evidence for competence in this unit must be considered holistically. Each element and associated performance criteria must be demonstrated on at least two occasions in accordance with the 'Assessment Guidelines – UEE11'. Evidence must also comprise:

A representative body of work performance demonstrated within the timeframes typically expected of the discipline, work function

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and industrial environment. In particular this must incorporate evidence that shows a candidate is able to:

- Implement Occupational Health and Safety workplace procedures and practices including the use of risk control measures as specified in the performance criteria and range statement
- Apply sustainable energy principles and practices as specified in the performance criteria and range statement
- Demonstrate an understanding of the essential knowledge and associated skills as described in this unit. It may be required by some jurisdictions that RTOs provide a percentile graded result for the purpose of regulatory or licensing requirements.
- Demonstrate an appropriate level of skills enabling employment
- Conduct work observing the relevant Anti Discrimination legislation, regulations, polices and workplace procedures

- Demonstrated consistent performance across a representative range of contexts from the prescribed items below:
  - Work safely with remote area power supply (RAPS) systems as described in 8) and including:

A Preparing to enter the RAPS system including, permission to enter the area and to isolate RAPS equipment

B Applying work procedures and instructions as they apply to risk control measures

C Dealing with accidents and emergencies

D Participating in consultation processes, identifying hazards and implementing and monitoring control measures

E Dealing with unplanned events by drawing on essential knowledge and skills to provide appropriate solutions incorporated in a holistic assessment with the above listed items

Context of and specific resources for assessment

9.3)

This unit should be assessed as it relates to normal work practice

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using procedures, information and resources typical of a workplace. This should include:

- OHS policy and work procedures and instructions.
- Suitable work environment, facilities, equipment and materials to undertake actual work as prescribed by this unit.

These should be part of the formal learning/assessment environment.

Note:

Where simulation is considered a suitable strategy for assessment, conditions must be authentic and as far as possible reproduce and replicate the workplace and be consistent with the approved industry simulation policy.

The resources used for assessment should reflect current industry practices in relation to working safely with remote area power supply (RAPS) systems.

Method of assessment

9.4)

This unit shall be assessed by methods given in Volume 1, Part 3 'Assessment Guidelines'.

Note:

Competent performance with inherent safe working practices is expected in the Industry to which this unit applies. This requires assessment in a structured environment which is intended primarily for learning/assessment and incorporates all necessary equipment and facilities for learners to develop and demonstrate the essential knowledge and skills described in this unit.

Concurrent assessment and relationship with other units

9.5)

For optimisation of training and assessment effort, competence development in this unit may be arranged concurrently with other units in a qualification or possible skill clusters in which this unit is included.

The critical aspects of occupational health and safety covered in unit UEENEEE101A and other discipline specific occupational

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health and safety units shall be incorporated in relation to this unit.

Range Statement

RANGE STATEMENT

10) This relates to the unit as a whole providing the range of contexts and conditions to which the performance criteria apply. It allows for different work environments and situations that will affect performance.

This unit must be demonstrated in relation to least two different RAPS systems incorporating a battery bank, a generator set and a photo voltaic array and at least one similar RAPS system with the additions of a wind generator.

Generic terms used throughout this Vocational Standard shall be regarded as part of the Range Statement in which competency is demonstrated. The definition of these and other terms that apply are given in Volume 2, Part 2.1.

Unit Sector(s)

Not applicable.

Competency Field

Competency Field **11)**

Renewable and Sustainable Energy

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UEENEEK103A Conduct periodic maintenance of remote area power supply battery banks

Modification History

Not applicable.

Unit Descriptor

Unit Descriptor **1) Scope:**

1.1) Descriptor

This unit covers maintenance of remote area power supply (RAPS) battery banks where the exposed voltage is not greater than 50 V a.c. or 120 V d.c. It encompasses working safely and to maintenance standards and following maintenance routines, identifying known types of battery faults using routine procedures and completing the necessary maintenance reporting.

Application of the Unit

Application of the Unit **2)**

This unit is intended primarily for indigenous persons seeking qualifications in RAPS system servicing. The unit may also be applied to work entry qualifications in renewable energy service work in general and be used in school-based vocational programs.

Licensing/Regulatory Information

License to practice **3)**

The skills and knowledge described in this unit do not require a license to practice in the workplace. However, practice in this unit is subject to regulations directly related to occupational health and safety and contracts of training such as new apprenticeships.

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Pre-Requisites

Prerequisite Unit(s) **4)**

Competencies **4.1)**

Granting competency in this unit shall be made only after competency in the following unit(s) has/have been confirmed.

UEENEEE101A	Apply Occupational Health Safety regulations, codes and practices in the workplace
UEENEEE102A	Fabricate, dismantle, assemble of utilities industry components
UEENEEK101A	Maintain safety and tidiness of remote area power supply systems
UEENEEE107A	Use drawings, diagrams, schedules, standards, codes and specifications
UEENEEK102A	Work safely with remote area power supply systems
UEENEEE131A	Solve problems in ELV circuits for non electrical workers

OR

UEENEEE104A	Solve problems in d.c. circuits

Literacy and numeracy skills **4.2)**

Participants are best equipped to achieve competency in this unit if they have reading, writing and numeracy skills indicated by the following scales. Description of each scale is given in Volume 2, Part 3 ‘Literacy and Numeracy’

Reading 3 Writing 3 Numeracy 3

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Employability Skills Information

Employability Skills	**5)**
	The required outcomes described in this unit of competency contain applicable facets of Employability Skills. The Employability Skills Summary of the qualification in which this unit of competency is packaged will assist in identifying Employability Skill requirements.

Elements and Performance Criteria Pre-Content

6) Elements describe the essential outcomes of a competency standard unit	Performance Criteria describe the required performance needed to demonstrate achievement of the element. Assessment of performance is to be consistent with the Evidence Guide.

Elements and Performance Criteria

ELEMENT	PERFORMANCE CRITERIA
1 Prepare to conduct periodic maintenance of battery banks	1.1 OHS procedures for a RAPS plant are identified, obtained and understood through established routines and procedures
	1.2 Established OHS risk control measures and procedures in preparation for the work are followed
	1.3 Safety hazards which have not previously been identified are reported and advice on risk control measures is sought from the work supervisor
	1.4 The nature and location of RAPS system is identified from documentation or from work supervisor to establish the scope of work to be undertaken
	1.5 Advice is sought from the work supervisor to ensure the work is coordinated effectively with

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ELEMENT	PERFORMANCE CRITERIA	
		fellow workers and the local community
	1.6	Sources of materials that may be required for the work are identified and accessed in accordance with established routines and procedures
	1.7	Tools, equipment and testing devices needed to carry out the work are obtained and checked for correct operation and safety
2 Maintain RAPS systems battery banks.	2.1	Established OHS risk control measures and procedures for carrying out the work are followed
	2.2	The need to test or measure live is determined in strict accordance with OHS requirements and when necessary conducted within established safety procedures
	2.3	Circuits/machines/plant are checked as being isolated where necessary in strict accordance OHS requirements and procedures
	2.4	Prescribed maintenance procedures are used to test and check RAPS system battery banks
	2.5	Battery bank maintenance, including performance measurements and repairs are carried out safely and to prescribed routines and procedures
	2.6	Known types of battery functional faults are identified using routine fault finding procedures
	2.7	Procedures are followed for referring non-routine events to immediate supervisor for directions
	2.8	Maintenance and repair work is carried out efficiently without waste of materials and energy and without damage to apparatus, circuits, the surrounding environment or services
	2.9	Routine quality checks are carried out in accordance with work instructions
3 Complete	3.1	OHS work completion risk control measures and

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ELEMENT	PERFORMANCE CRITERIA	
maintenance work on battery banks and report.		procedures are followed
	3.2	Work site is cleaned and made safe in accordance with routine procedures
	3.3	Procedures for referring local maintenance issues to the community are followed
	3.4	Battery bank performance measurements are reported to the work supervisor through the established maintenance reporting procedures

Required Skills and Knowledge

REQUIRED SKILLS AND KNOWLEDGE

8) This describes the essential skills and knowledge and their level, required for this unit.

Evidence must show that knowledge has been acquired of safe working practices and conducting periodic maintenance of remote area power supply (RAPS) battery banks.

All knowledge and skills detailed in this unit should be contextualised to current industry practices and technologies.

KS01-EK103A RAPS systems battery bank maintenance techniques

Evidence shall show an understanding of maintaining RAPS battery systems to an extent indicated by the following aspects:

T1 Basic battery maintenance encompassing:

- scope of regular testing, checking and corrective actions
- measurement of specific gravity and voltages of battery cells;
- checking and topping up electrolyte levels;
- checking for acid leakage, cracks in battery casing, corrosion of battery terminals and connections,
- cleaning of terminal connections and treating with an anticorrosive

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Evidence Guide

EVIDENCE GUIDE

9) This provides essential advice for assessment of the unit and must be read in conjunction with the performance criteria and the range statement of the unit and the Training Package Assessment Guidelines.

The Evidence Guide forms an integral part of this unit. It must be used in conjunction with all parts of this unit and performed in accordance with the Assessment Guidelines of this Training Package.

Overview of Assessment **9.1)**

Longitudinal competency development approaches to assessment, such as Profiling, require data to be reliably gathered in a form that can be consistently interpreted over time. This approach is best utilised in Apprenticeship programs and reduces assessment intervention. It is the industry-preferred model for apprenticeships. However, where summative (or final) assessment is used it is to include the application of the competency in the normal work environment or, at a minimum, the application of the competency in a realistically simulated work environment. In some circumstances, assessment in part or full can occur outside the workplace. However, it must be in accordance with industry and regulatory policy.

Methods chosen for a particular assessment will be influenced by various factors. These include the extent of the assessment, the most effective locations for the assessment activities to take place, access to physical resources, additional safety measures that may be required and the critical nature of the competencies being assessed.

The critical safety issues inherent in working with electricity, electrical equipment, gas or any other hazardous substance/material present a challenge for those determining competence. Sources of evidence need to be ‘rich’ in nature to minimise error in judgment.

Activities associated with normal everyday work have a bearing on the decision as to how much and how detailed the data gathered will contribute to its ‘richness’. Some skills are more critical to safety and operational requirements while the same skills may be more or less frequently practised. These points are raised for the assessors to consider when choosing an assessment method and developing assessment instruments. Sample assessment instruments are included for Assessors in the Assessment

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Guidelines of this Training Package.

Critical aspects of evidence required to demonstrate competency in this unit

9.2)

Before the critical aspects of evidence are considered all prerequisites must be met.

Evidence for competence in this unit must be considered holistically. Each element and associated performance criteria must be demonstrated on at least two occasions in accordance with the 'Assessment Guidelines – UEE11'. Evidence must also comprise:

- A representative body of work performance demonstrated within the timeframes typically expected of the discipline, work function and industrial environment. In particular this must incorporate evidence that shows a candidate is able to:
  - Implement Occupational Health and Safety workplace procedures and practices including the use of risk control measures as specified in the performance criteria and range statement
  - Apply sustainable energy principles and practices as specified in the performance criteria and range statement
  - Demonstrate an understanding of the essential knowledge and associated skills as described in this unit. It may be required by some jurisdictions that RTOs provide a percentile graded result for the purpose of regulatory or licensing requirements.
  - Demonstrate an appropriate level of skills enabling employment
  - Conduct work observing the relevant Anti Discrimination legislation, regulations, polices and workplace procedures
- Demonstrated consistent performance across a representative range of contexts from the prescribed items below:
  - Conduct periodic maintenance of remote area power supply (RAPS) battery banks as described in 8) and including:

A Measuring and recording specific gravity of electrolyte

B Measuring and recording cell voltages

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C	Visual inspecting of batteries for low electrolyte levels; electrolyte leakage corroded terminals and connections
D	Topping up low electrolyte levels
E	Identifying electrolyte leaks
F	Cleaning corroded terminals and connections and treating with an anticorrosive
G	Reporting all maintenance activities
H	Dealing with unplanned events by drawing on essential knowledge and skills to provide appropriate solutions incorporated in a holistic assessment with the above listed items

Note:
Successful completion of relevant vendor training may be used to contribute to evidence on which competency is deemed. In these cases the alignment of outcomes of vendor training with performance criteria and critical aspects of evidence must be clearly identified.

Context of and specific resources for assessment

9.3)

This unit should be assessed as it relates to normal work practice using procedures, information and resources typical of a workplace. This should include:

- OHS policy and work procedures and instructions.
- Suitable work environment, facilities, equipment and materials to undertake actual work as prescribed by this unit.

These should be part of the formal learning/assessment environment.

Note:

Where simulation is considered a suitable strategy for assessment, conditions must be authentic and as far as possible reproduce and replicate the workplace and be consistent with the approved industry simulation policy.

The resources used for assessment should reflect current industry practices in relation to conducting periodic maintenance of remote

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area power supply (RAPS) battery banks.

Method of assessment **9.4)**

This unit shall be assessed by methods given in Volume 1, Part 3 'Assessment Guidelines'.

Note:
Competent performance with inherent safe working practices is expected in the Industry to which this unit applies. This requires assessment in a structured environment which is intended primarily for learning/assessment and incorporates all necessary equipment and facilities for learners to develop and demonstrate the essential knowledge and skills described in this unit.

Concurrent assessment and relationship with other units **9.5)**

For optimisation of training and assessment effort, competency development in this unit may be arranged concurrently with unit:

UEENEEK104A	Conduct periodic maintenance of remote area power supply generator sets
UEENEEK105A	Conduct periodic maintenance of remote area power supply photo voltaic arrays
UEENEEK106A	Conduct periodic maintenance of remote area power supply wind generators

The critical aspects of occupational health and safety covered in unit UEENEEE101A and other discipline specific occupational health and safety units shall be incorporated in relation to this unit.

Range Statement

RANGE STATEMENT

10) This relates to the unit as a whole providing the range of contexts and conditions to which the performance criteria apply. It allows for different work environments and

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RANGE STATEMENT

situations that will affect performance.

This unit must be demonstrated in relation to least two different RAPS systems in which the battery bank is charged from a generator set and a photo voltaic array and at least one similar RAPS system where the battery bank is charged form a wind generator.

Generic terms used throughout this Vocational Standard shall be regarded as part of the Range Statement in which competency is demonstrated. The definition of these and other terms that apply are given in Volume 2, Part 2.1.

Unit Sector(s)

Not applicable.

Competency Field

Competency Field **11)**

Renewable and Sustainable Energy

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UEENEEK104A Conduct periodic maintenance of remote area power supply generator sets

Modification History

Release	Action	Core/Elective	Details	Points
2	Edit		Show full pre-req chain in the unit	

Unit Descriptor

Unit Descriptor **1) Scope:**

1.1) Descriptor

This unit covers maintenance of remote area power supply (RAPS) generator sets where the exposed voltage is not greater than 50 V a.c. or 120 V d.c. It encompasses working safely and to maintenance standards and following maintenance routines, identifying known types of generator faults using routine procedures and completing the necessary maintenance reporting

Application of the Unit

Application of the Unit **2)**

This unit is intended primarily for indigenous persons seeking qualifications in RAPS system servicing. The unit may also be applied to work entry qualifications in renewable energy service work in general and be used in school-based vocational programs.

Licensing/Regulatory Information

License to practice **3)**

The skills and knowledge described in this unit do not

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License to practice **3)**

require a license to practice in the workplace. However, practice in this unit is subject to regulations directly related to occupational health and safety and contracts of training such as new apprenticeships.

Pre-Requisites

Prerequisite Unit(s) **4)**

Competencies **4.1)**

Granting competency in this unit shall be made only after competency in the following unit(s) has/have been confirmed.

UEENEEE101A	Apply Occupational Health Safety regulations, codes and practices in the workplace
UEENEEE102A	Fabricate, dismantle, assemble of utilities industry components
UEENEEK101A	Maintain safety and tidiness of remote area power supply systems
UEENEEE107A	Use drawings, diagrams, schedules, standards, codes and specifications
UEENEEK102A	Work safely with remote area power supply systems
UEENEEE131A	Solve problems in ELV circuits for non electrical workers

OR

UEENEEE104A	Solve problems in d.c. circuits

Literacy and numeracy skills **4.2)**

Participants are best equipped to achieve competency in

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this unit if they have reading, writing and numeracy skills indicated by the following scales. Description of each scale is given in Volume 2, Part 3 'Literacy and Numeracy'

Reading 3 Writing 3 Numeracy 3

Employability Skills Information

Employability Skills **5)**

The required outcomes described in this unit of competency contain applicable facets of Employability Skills. The Employability Skills Summary of the qualification in which this unit of competency is packaged will assist in identifying Employability Skill requirements.

Elements and Performance Criteria Pre-Content

6) Elements describe the essential outcomes of a competency standard unit

Performance Criteria describe the required performance needed to demonstrate achievement of the element. Assessment of performance is to be consistent with the Evidence Guide.

Elements and Performance Criteria

ELEMENT	PERFORMANCE CRITERIA
1 Prepare to conduct periodic maintenance on generator sets	1.1 OHS procedures for a RAPS plant are identified, obtained and understood through established routines and procedures
	1.2 Established OHS risk control measures and procedures in preparation for the work are followed
	1.3 Safety hazards which have not previously been identified are reported and advice on risk control measures is sought from the work supervisor

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ELEMENT	PERFORMANCE CRITERIA	
	1.4	The nature and location of RAPS system is identified from documentation or from work supervisor to establish the scope of work to be undertaken
	1.5	Advice is sought from the work supervisor to ensure the work is coordinated effectively with fellow workers and the local community
	1.6	Sources of materials that may be required for the work are identified and accessed in accordance with established routines and procedures
	1.7	Tools, equipment and testing devices needed to carry out the work are obtained and checked for correct operation and safety
2 Maintain RAPS systems generator sets	2.1	Established OHS risk control measures and procedures for carrying out the work are followed
	2.2	The need to test or measure live is determined in strict accordance with OHS requirements and when necessary conducted within established safety procedures
	2.3	Circuits/machines/plant are checked as being isolated where necessary in strict accordance OHS requirements and procedures
	2.4	Prescribed maintenance procedures are used to test and check RAPS system generator sets
	2.5	Generator set maintenance, including performance measurements and repairs, are carried out safely and to prescribed routines and procedures
	2.6	Known types of generator set functional faults are identified using routine fault finding procedures
	2.7	Procedures are followed for referring non-routine events to immediate supervisor for directions
	2.8	Maintenance and repair work is carried out

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ELEMENT	PERFORMANCE CRITERIA	
		efficiently without waste of materials and energy and without damage to apparatus, circuits, the surrounding environment or services
	2.9	Routine quality checks are carried out in accordance with work instructions.
3 Complete maintenance work of generator sets and report	3.1	OHS work completion risk control measures and procedures are followed
	3.2	Work site is cleaned and made safe in accordance with routine procedures
	3.3	Procedures for referring local maintenance issues to the community are followed
	3.4	Generator set performance measurements are reported to the work supervisor through the established maintenance reporting procedures

Required Skills and Knowledge

REQUIRED SKILLS AND KNOWLEDGE

8) This describes the essential skills and knowledge and their level, required for this unit.

Evidence must show that knowledge has been acquired of safe working practices and conducting periodic maintenance of remote area power supply (RAPS) generator sets.

All knowledge and skills detailed in this unit should be contextualised to current industry practices and technologies.

KS01-EK104A RAPS system generator sets maintenance techniques

Evidence shall show an understanding of maintaining remote area power supply generator sets to an extent indicated by the following aspects:

T1 Basic generator set maintenance encompassing:

- Checking of radiator and oil level;
- Periodic oil change
- Periodic air, oil and fuel filter change.
- Maintaining log books for maintenance regime

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Evidence Guide

EVIDENCE GUIDE

9) This provides essential advice for assessment of the unit and must be read in conjunction with the performance criteria and the range statement of the unit and the Training Package Assessment Guidelines.

The Evidence Guide forms an integral part of this unit. It must be used in conjunction with all parts of this unit and performed in accordance with the Assessment Guidelines of this Training Package.

Overview of Assessment **9.1)**

Longitudinal competency development approaches to assessment, such as Profiling, require data to be reliably gathered in a form that can be consistently interpreted over time. This approach is best utilised in Apprenticeship programs and reduces assessment intervention. It is the industry-preferred model for apprenticeships. However, where summative (or final) assessment is used it is to include the application of the competency in the normal work environment or, at a minimum, the application of the competency in a realistically simulated work environment. In some circumstances, assessment in part or full can occur outside the workplace. However, it must be in accordance with industry and regulatory policy.

Methods chosen for a particular assessment will be influenced by various factors. These include the extent of the assessment, the most effective locations for the assessment activities to take place, access to physical resources, additional safety measures that may be required and the critical nature of the competencies being assessed.

The critical safety issues inherent in working with electricity, electrical equipment, gas or any other hazardous substance/material present a challenge for those determining competence. Sources of evidence need to be ‘rich’ in nature to minimise error in judgment.

Activities associated with normal everyday work have a bearing on the decision as to how much and how detailed the data gathered will contribute to its ‘richness’. Some skills are more critical to safety and operational requirements while the same skills may be more or less frequently practised. These points are raised for the

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assessors to consider when choosing an assessment method and developing assessment instruments. Sample assessment instruments are included for Assessors in the Assessment Guidelines of this Training Package.

Critical aspects of evidence required to demonstrate competency in this unit

9.2)

Before the critical aspects of evidence are considered all prerequisites must be met.

Evidence for competence in this unit must be considered holistically. Each element and associated performance criteria must be demonstrated on at least two occasions in accordance with the 'Assessment Guidelines – UEE11'. Evidence must also comprise:

- A representative body of work performance demonstrated within the timeframes typically expected of the discipline, work function and industrial environment. In particular this must incorporate evidence that shows a candidate is able to:
  - Implement Occupational Health and Safety workplace procedures and practices including the use of risk control measures as specified in the performance criteria and range statement
  - Apply sustainable energy principles and practices as specified in the performance criteria and range statement
  - Demonstrate an understanding of the essential knowledge and associated skills as described in this unit. It may be required by some jurisdictions that RTOs provide a percentile graded result for the purpose of regulatory or licensing requirements.
  - Demonstrate an appropriate level of skills enabling employment
  - Conduct work observing the relevant Anti Discrimination legislation, regulations, polices and workplace procedures
- Demonstrated consistent performance across a representative range of contexts from the prescribed items below:
  - Conduct periodic maintenance of remote area power supply (RAPS) generator sets as described in 8) and including:

A Measuring and recording generator no-load and

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	load voltages
B	Measuring and recording generator output for three load conditions
C	Checking drive engine coolant and oil level
D	Visually inspecting drive engine for coolant and oil leaks
E	Checking condition of drive engine oil, oil filter and air filter
F	Identifying need to change drive engine oil, oil filter and air filter
G	Changing drive engine oil, oil filter and air filter
H	Topping up low coolant and oil levels
I	Identifying the cause of any coolant and oil leaks
J	Reporting all maintenance activities
K	Dealing with unplanned events by drawing on essential knowledge and skills to provide appropriate solutions incorporated in a holistic assessment with the above listed items

Context of and specific resources for assessment

9.3)

This unit should be assessed as it relates to normal work practice using procedures, information and resources typical of a workplace. This should include:

- OHS policy and work procedures and instructions.
- Suitable work environment, facilities, equipment and materials to undertake actual work as prescribed by this unit.

These should be part of the formal learning/assessment environment.

Note:

Where simulation is considered a suitable strategy for assessment, conditions must be authentic and as far as possible reproduce and

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replicate the workplace and be consistent with the approved industry simulation policy.

The resources used for assessment should reflect current industry practices in relation to conducting periodic maintenance of remote area power supply (RAPS) generator sets.

Method of assessment **9.4)**

This unit shall be assessed by methods given in Volume 1, Part 3 'Assessment Guidelines'.

Note:
Competent performance with inherent safe working practices is expected in the Industry to which this unit applies. This requires assessment in a structured environment which is intended primarily for learning/assessment and incorporates all necessary equipment and facilities for learners to develop and demonstrate the essential knowledge and skills described in this unit.

Concurrent assessment and relationship with other units **9.5)**

For optimisation of training and assessment effort, competency development in this unit may be arranged concurrently with unit:

UEENEEK103A	Conduct periodic maintenance of remote area power supply battery banks
UEENEEK105A	Conduct periodic maintenance of remote area power supply photo voltaic arrays
UEENEEK106A	Conduct periodic maintenance of remote area power supply wind generators

The critical aspects of occupational health and safety covered in unit UEENEEE101A and other discipline specific occupational health and safety units shall be incorporated in relation to this unit.

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Range Statement

RANGE STATEMENT

10) This relates to the unit as a whole providing the range of contexts and conditions to which the performance criteria apply. It allows for different work environments and situations that will affect performance.

This unit must be demonstrated in relation to least two different RAPS systems in which the generator set is charged from a generator set and a photo voltaic array and at least one similar RAPS system where the generator set is charged form a wind generator.

Generic terms used throughout this Vocational Standard shall be regarded as part of the Range Statement in which competency is demonstrated. The definition of these and other terms that apply are given in Volume 2, Part 2.1.

Unit Sector(s)

Not applicable.

Competency Field

Competency Field **11)**

Renewable and Sustainable Energy

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UEENEEK105A Conduct periodic maintenance of remote area power supply photo voltaic arrays

Modification History

Not applicable.

Unit Descriptor

Unit Descriptor **1) Scope:**

1.1) Descriptor

This unit covers maintenance of remote area power supply (RAPS) photo voltaic arrays where the exposed voltage is not greater than 50 V a.c. or 120 V d.c. It encompasses working safely and to maintenance standards and following maintenance routines, identifying known types of photo voltaic array faults using routine procedures and completing the necessary maintenance reporting.

Application of the Unit

Application of the Unit **2)**

This unit is intended primarily for indigenous persons seeking qualifications in RAPS system servicing. The unit may also be applied to work entry qualifications in renewable energy service work in general and be used in school-based vocational programs.

Licensing/Regulatory Information

License to practice **3)**

The skills and knowledge described in this unit do not require a license to practice in the workplace. However, practice in this unit is subject to regulations directly related to occupational health and safety and contracts of training such as new apprenticeships.

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Pre-Requisites

Prerequisite Unit(s) **4)**

Competencies **4.1)**

Granting competency in this unit shall be made only after competency in the following unit(s) has/have been confirmed.

UEENEEE101A	Apply Occupational Health Safety regulations, codes and practices in the workplace
UEENEEE102A	Fabricate, dismantle, assemble of utilities industry components
UEENEEK101A	Maintain safety and tidiness of remote area power supply systems
UEENEEE107A	Use drawings, diagrams, schedules, standards, codes and specifications
UEENEEK102A	Work safely with remote area power supply systems
UEENEEE131A	Solve problems in ELV circuits for non electrical workers

OR

UEENEEE104A	Solve problems in d.c. circuits

Literacy and numeracy skills **4.2)**

Participants are best equipped to achieve competency in this unit if they have reading, writing and numeracy skills indicated by the following scales. Description of each scale is given in Volume 2, Part 3 ‘Literacy and Numeracy’

Reading 3 Writing 3 Numeracy 3

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Employability Skills Information

Employability Skills	**5)**
	The required outcomes described in this unit of competency contain applicable facets of Employability Skills. The Employability Skills Summary of the qualification in which this unit of competency is packaged will assist in identifying Employability Skill requirements.

Elements and Performance Criteria Pre-Content

6) Elements describe the essential outcomes of a competency standard unit	Performance Criteria describe the required performance needed to demonstrate achievement of the element. Assessment of performance is to be consistent with the Evidence Guide.

Elements and Performance Criteria

ELEMENT	PERFORMANCE CRITERIA
1 Prepare to conduct periodic maintenance on photo voltaic arrays	1.1 OHS procedures for a RAPS plant are identified, obtained and understood through established routines and procedures.
	1.2 Established OHS risk control measures and procedures in preparation for the work are followed.
	1.3 Safety hazards which have not previously been identified are reported and advice on risk control measures is sought from the work supervisor.
	1.4 The nature and location of RAPS system is identified from documentation or from work supervisor to establish the scope of work to be undertaken.
	1.5 Advice is sought from the work supervisor to ensure the work is coordinated effectively with

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ELEMENT	PERFORMANCE CRITERIA	
		fellow workers and the local community.
	1.6	Sources of materials that may be required for the work are identified and accessed in accordance with established routines and procedures.
	1.7	Tools, equipment and testing devices needed to carry out the work are obtained and checked for correct operation and safety.
2 Maintain RAPS systems photo voltaic arrays	2.1	Established OHS risk control measures and procedures for carrying out the work are followed.
	2.2	The need to test or measure live is determined in strict accordance with OHS requirements and when necessary conducted within established safety procedures.
	2.3	Circuits/machines/plant are checked as being isolated where necessary in strict accordance OHS requirements and procedures.
	2.4	Prescribed maintenance procedures are used to test and check RAPS system photo voltaic arrays.
	2.5	Photo voltaic array maintenance, including performance measurements and repairs are carried out safely and to prescribed routines and procedures.
	2.6	Known types of photo voltaic array functional faults are identified using routine fault finding procedures.
	2.7	Procedures are followed for referring non-routine events to immediate supervisor for directions.
	2.8	Maintenance and repair work is carried out efficiently without waste of materials and energy and without damage to apparatus, circuits, the surrounding environment or services
	2.9	Routine quality checks are carried out in accordance with work instructions.

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ELEMENT	PERFORMANCE CRITERIA	
3 Complete maintenance work of photo voltaic arrays and report	3.1	OHS work completion risk control measures and procedures are followed.
	3.2	Work site is cleaned and made safe in accordance with routine procedures.
	3.3	Procedures for referring local maintenance issues to the community are followed.
	3.4	Photo voltaic array performance measurements are reported to the work supervisor through the established maintenance reporting procedures.

Required Skills and Knowledge

REQUIRED SKILLS AND KNOWLEDGE

8) This describes the essential skills and knowledge and their level, required for this unit.

Evidence must show that knowledge has been acquired of safe working practices and conducting periodic maintenance of remote area power supply (RAPS) photo voltaic arrays sets.

All knowledge and skills detailed in this unit should be contextualised to current industry practices and technologies.

KS01-EK105A RAPS systems photovoltaic array maintenance techniques

Evidence shall show an understanding of maintaining remote area power supply (RAPS) photovoltaic arrays to an extent indicated by the following aspects:

T1 RAPS systems photovoltaic array maintenance techniques encompassing:

- Cleaning of photo voltaic modules
- Checking for damage or de-lamination
- Checking of module connections, connecting cable and integrity of the array structure
- Maintaining log books and maintenance regime

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Evidence Guide

EVIDENCE GUIDE

9) This provides essential advice for assessment of the unit and must be read in conjunction with the performance criteria and the range statement of the unit and the Training Package Assessment Guidelines.

The Evidence Guide forms an integral part of this unit. It must be used in conjunction with all parts of this unit and performed in accordance with the Assessment Guidelines of this Training Package.

Overview of Assessment **9.1)**

Longitudinal competency development approaches to assessment, such as Profiling, require data to be reliably gathered in a form that can be consistently interpreted over time. This approach is best utilised in Apprenticeship programs and reduces assessment intervention. It is the industry-preferred model for apprenticeships. However, where summative (or final) assessment is used it is to include the application of the competency in the normal work environment or, at a minimum, the application of the competency in a realistically simulated work environment. In some circumstances, assessment in part or full can occur outside the workplace. However, it must be in accordance with industry and regulatory policy.

Methods chosen for a particular assessment will be influenced by various factors. These include the extent of the assessment, the most effective locations for the assessment activities to take place, access to physical resources, additional safety measures that may be required and the critical nature of the competencies being assessed.

The critical safety issues inherent in working with electricity, electrical equipment, gas or any other hazardous substance/material present a challenge for those determining competence. Sources of evidence need to be ‘rich’ in nature to minimise error in judgment.

Activities associated with normal everyday work have a bearing on the decision as to how much and how detailed the data gathered will contribute to its ‘richness’. Some skills are more critical to safety and operational requirements while the same skills may be more or less frequently practised. These points are raised for the assessors to consider when choosing an assessment method and developing assessment instruments. Sample assessment instruments are included for Assessors in the Assessment

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Guidelines of this Training Package.

Critical aspects of evidence required to demonstrate competency in this unit

9.2)

Before the critical aspects of evidence are considered all prerequisites must be met.

Evidence for competence in this unit must be considered holistically. Each element and associated performance criteria must be demonstrated on at least two occasions in accordance with the 'Assessment Guidelines – UEE11'. Evidence must also comprise:

- A representative body of work performance demonstrated within the timeframes typically expected of the discipline, work function and industrial environment. In particular this must incorporate evidence that shows a candidate is able to:
  - Implement Occupational Health and Safety workplace procedures and practices including the use of risk control measures as specified in the performance criteria and range statement
  - Apply sustainable energy principles and practices as specified in the performance criteria and range statement
  - Demonstrate an understanding of the essential knowledge and associated skills as described in this unit. It may be required by some jurisdictions that RTOs provide a percentile graded result for the purpose of regulatory or licensing requirements.
  - Demonstrate an appropriate level of skills enabling employment
  - Conduct work observing the relevant Anti Discrimination legislation, regulations, polices & workplace procedures
- Demonstrated consistent performance across a representative range of contexts from the prescribed items below:
  - Conduct periodic maintenance of remote area power supply (RAPS) photo voltaic arrays as described in 8) and including:

A Measuring and recording array no-load and load voltages together with ambient temperature

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B	Measuring and recording array output for three load conditions
C	Visually inspecting array modules and support structure for physical damage
D	Visually inspecting array connections and cables
E	Identifying array defects and faults
F	Reporting all maintenance activities
G	Dealing with unplanned events by drawing on essential knowledge and skills to provide appropriate solutions incorporated in a holistic assessment with the above listed items

Context of and specific resources for assessment

9.3)

This unit should be assessed as it relates to normal work practice using procedures, information and resources typical of a workplace. This should include:

- OHS policy and work procedures and instructions.
- Suitable work environment, facilities, equipment and materials to undertake actual work as prescribed by this unit.

These should be part of the formal learning/assessment environment.

Note:

Where simulation is considered a suitable strategy for assessment, conditions must be authentic and as far as possible reproduce and replicate the workplace and be consistent with the approved industry simulation policy.

The resources used for assessment should reflect current industry practices in relation to conducting periodic maintenance of remote area power supply (RAPS) photo voltaic arrays.

Method of assessment

9.4)

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This unit shall be assessed by methods given in Volume 1, Part 3 'Assessment Guidelines'.

Note:

Competent performance with inherent safe working practices is expected in the Industry to which this unit applies. This requires assessment in a structured environment which is intended primarily for learning/assessment and incorporates all necessary equipment and facilities for learners to develop and demonstrate the essential knowledge and skills described in this unit.

Concurrent assessment and relationship with other units

9.5)

For optimisation of training and assessment effort, competency development in this unit may be arranged concurrently with unit:

UEENEEK103A	Conduct periodic maintenance of remote area power supply battery banks
UEENEEK104A	Conduct periodic maintenance of remote area power supply generator sets
UEENEEK106A	Conduct periodic maintenance of remote area power supply wind generators

The critical aspects of occupational health and safety covered in unit UEENEEE101A and other discipline specific occupational health and safety units shall be incorporated in relation to this unit.

Range Statement

RANGE STATEMENT

10) This relates to the unit as a whole providing the range of contexts and conditions to which the performance criteria apply. It allows for different work environments and situations that will affect performance.

This unit must be demonstrated in relation to least two different RAPS systems in which the photo voltaic array is charged from a photo voltaic array and a photo voltaic array and at least one similar RAPS system where the photo voltaic array is charged form a wind generator.

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RANGE STATEMENT

Generic terms used throughout this Vocational Standard shall be regarded as part of the Range Statement in which competency is demonstrated. The definition of these and other terms that apply are given in Volume 2, Part 2.1.

Unit Sector(s)

Not applicable.

Competency Field

Competency Field **11)**

Renewable and Sustainable Energy

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UEENEEK106A Conduct periodic maintenance of remote area power supply wind generators

Modification History

Not applicable.

Unit Descriptor

Unit Descriptor **1) Scope:**

1.1) Descriptor

This unit covers maintenance of remote area power supply (RAPS) wind generators where the exposed voltage is not greater than 50 V a.c. or 120 V d.c. It encompasses working safely and to maintenance standards and following maintenance routines, identifying known types of wind generator faults using routine procedures and completing the necessary maintenance reporting.

Application of the Unit

Application of the Unit **2)**

This unit is intended primarily for indigenous persons seeking qualifications in RAPS system servicing. The unit may also be applied to work entry qualifications in renewable energy service work in general and be used in school-based vocational programs.

Licensing/Regulatory Information

License to practice **3)**

The skills and knowledge described in this unit do not require a license to practice in the workplace. However, practice in this unit is subject to regulations directly related to occupational health and safety and contracts of training such as new apprenticeships.

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Pre-Requisites

Prerequisite Unit(s) **4)**

Competencies **4.1)**

Granting competency in this unit shall be made only after competency in the following unit(s) has/have been confirmed.

UEENEEE101A	Apply Occupational Health Safety regulations, codes and practices in the workplace
UEENEEE102A	Fabricate, dismantle, assemble of utilities industry components
UEENEEK101A	Maintain safety and tidiness of remote area power supply systems
UEENEEE107A	Use drawings, diagrams, schedules, standards, codes and specifications
UEENEEK102A	Work safely with remote area power supply systems
UEENEEE131A	Solve problems in ELV circuits for non electrical workers

OR

UEENEEE104A	Solve problems in d.c. circuits

Literacy and numeracy skills **4.2)**

Participants are best equipped to achieve competency in this unit if they have reading, writing and numeracy skills indicated by the following scales. Description of each scale is given in Volume 2, Part 3 ‘Literacy and Numeracy’

Reading 3 Writing 3 Numeracy 3

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Employability Skills Information

Employability Skills **5)**

The required outcomes described in this unit of competency contain applicable facets of Employability Skills. The Employability Skills Summary of the qualification in which this unit of competency is packaged will assist in identifying Employability Skill requirements.

Elements and Performance Criteria Pre-Content

6) Elements describe the essential outcomes of a competency standard unit

Performance Criteria describe the required performance needed to demonstrate achievement of the element. Assessment of performance is to be consistent with the Evidence Guide.

Elements and Performance Criteria

ELEMENT	PERFORMANCE CRITERIA
1 Prepare to conduct periodic maintenance on wind generators	1.1 OHS procedures for a RAPS plant are identified, obtained and understood through established routines and procedures
	1.2 Established OHS risk control measures and procedures in preparation for the work are followed.
	1.3 Safety hazards which have not previously been identified are reported and advice on risk control measures is sought from the work supervisor.
	1.4 The nature and location of RAPS system is identified from documentation or from work supervisor to establish the scope of work to be undertaken.
	1.5 Advice is sought from the work supervisor to ensure the work is coordinated effectively with

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ELEMENT	PERFORMANCE CRITERIA	
		fellow workers and the local community.
	1.6	Sources of materials that may be required for the work are identified and accessed in accordance with established routines and procedures.
	1.7	Tools, equipment and testing devices needed to carry out the work are obtained and checked for correct operation and safety
2 Maintain RAPS systems wind generators	2.1	Established OHS risk control measures and procedures for carrying out the work are followed.
	2.2	The need to test or measure live is determined in strict accordance with OHS requirements and when necessary conducted within established safety procedures
	2.3	Circuits/machines/plant are checked as being isolated where necessary in strict accordance OHS requirements and procedures
	2.4	Prescribed maintenance procedures are used to test and check RAPS system wind generators
	2.5	Wind generator maintenance, including performance measurements and repairs, are carried out safely and to prescribed routines and procedures.
	2.6	Known types of wind generator functional faults are identified using routine fault finding procedures.
	2.7	Procedures are followed for referring non-routine events to immediate supervisor for directions.
	2.8	Maintenance and repair work is carried out efficiently without waste of materials and energy and without damage to apparatus, circuits, the surrounding environment or services
	2.9	Routine quality checks are carried out in accordance with work instructions.

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ELEMENT	PERFORMANCE CRITERIA	
3 Complete maintenance work of wind generators and report	3.1	OHS work completion risk control measures and procedures are followed.
	3.2	Work site is cleaned and made safe in accordance with routine procedures.
	3.3	Procedures for referring local maintenance issues to the community are followed.
	3.4	Wind generator performance measurements are reported to the work supervisor through the established maintenance reporting procedures.

Required Skills and Knowledge

REQUIRED SKILLS AND KNOWLEDGE

8) This describes the essential skills and knowledge and their level, required for this unit.

Evidence must show that knowledge has been acquired of safe working practices and conducting periodic maintenance of remote area power supply (RAPS) wind generators.

All knowledge and skills detailed in this unit should be contextualised to current industry practices and technologies.

KS01-EK106A RAPS systems wind generator maintenance techniques

Evidence shall show an understanding of maintaining small wind generator systems to an extent indicated by the following aspects:

T1 Wind generator minor maintenance encompassing:

- Checking the integrity of support structure
- Tension of stay wires
- Visual inspection of wind generator operation
- Maintaining log books and maintenance regime

Evidence Guide

EVIDENCE GUIDE

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EVIDENCE GUIDE

9) This provides essential advice for assessment of the unit and must be read in conjunction with the performance criteria and the range statement of the unit and the Training Package Assessment Guidelines.

The Evidence Guide forms an integral part of this unit. It must be used in conjunction with all parts of this unit and performed in accordance with the Assessment Guidelines of this Training Package.

Overview of Assessment **9.1)**

Longitudinal competency development approaches to assessment, such as Profiling, require data to be reliably gathered in a form that can be consistently interpreted over time. This approach is best utilised in Apprenticeship programs and reduces assessment intervention. It is the industry-preferred model for apprenticeships. However, where summative (or final) assessment is used it is to include the application of the competency in the normal work environment or, at a minimum, the application of the competency in a realistically simulated work environment. In some circumstances, assessment in part or full can occur outside the workplace. However, it must be in accordance with industry and regulatory policy.

Methods chosen for a particular assessment will be influenced by various factors. These include the extent of the assessment, the most effective locations for the assessment activities to take place, access to physical resources, additional safety measures that may be required and the critical nature of the competencies being assessed.

The critical safety issues inherent in working with electricity, electrical equipment, gas or any other hazardous substance/material present a challenge for those determining competence. Sources of evidence need to be ‘rich’ in nature to minimise error in judgment.

Activities associated with normal everyday work have a bearing on the decision as to how much and how detailed the data gathered will contribute to its ‘richness’. Some skills are more critical to safety and operational requirements while the same skills may be more or less frequently practised. These points are raised for the assessors to consider when choosing an assessment method and developing assessment instruments. Sample assessment instruments are included for Assessors in the Assessment Guidelines of this Training Package.

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Critical aspects of evidence required to demonstrate competency in this unit

9.2)

Before the critical aspects of evidence are considered all prerequisites must be met.

Evidence for competence in this unit must be considered holistically. Each element and associated performance criteria must be demonstrated on at least two occasions in accordance with the 'Assessment Guidelines – UEE11'. Evidence must also comprise:

- A representative body of work performance demonstrated within the timeframes typically expected of the discipline, work function and industrial environment. In particular this must incorporate evidence that shows a candidate is able to:
  - Implement Occupational Health and Safety workplace procedures and practices including the use of risk control measures as specified in the performance criteria and range statement
  - Apply sustainable energy principles and practices as specified in the performance criteria and range statement
  - Demonstrate an understanding of the essential knowledge and associated skills as described in this unit. It may be required by some jurisdictions that RTOs provide a percentile graded result for the purpose of regulatory or licensing requirements.
  - Demonstrate an appropriate level of skills enabling employment
  - Conduct work observing the relevant Anti Discrimination legislation, regulations, polices and workplace procedures
- Demonstrated consistent performance across a representative range of contexts from the prescribed items below:
  - Conduct periodic maintenance of remote area power supply (RAPS) wind generators as described in 8) and including:

A Measuring and recording generator no-load and load voltages;

B Measuring and recording generator output for three load conditions;

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C	Visually inspecting generator and support structure for physical damage;
D	Visually inspecting generator connections and cables;
E	Identifying generator defects and faults;
F	Reporting all maintenance activities
G	Dealing with unplanned events by drawing on essential knowledge and skills to provide appropriate solutions incorporated in a holistic assessment with the above listed items

Context of and specific resources for assessment

9.3)

This unit should be assessed as it relates to normal work practice using procedures, information and resources typical of a workplace. This should include:

- OHS policy and work procedures and instructions.
- Suitable work environment, facilities, equipment and materials to undertake actual work as prescribed by this unit.

These should be part of the formal learning/assessment environment.

Note:

Where simulation is considered a suitable strategy for assessment, conditions must be authentic and as far as possible reproduce and replicate the workplace and be consistent with the approved industry simulation policy.

The resources used for assessment should reflect current industry practices in relation to conducting periodic maintenance of remote area power supply (RAPS) wind generators.

Method of assessment

9.4)

This unit shall be assessed by methods given in Volume 1, Part 3

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'Assessment Guidelines'.

Note:
Competent performance with inherent safe working practices is expected in the Industry to which this unit applies. This requires assessment in a structured environment which is intended primarily for learning/assessment and incorporates all necessary equipment and facilities for learners to develop and demonstrate the essential knowledge and skills described in this unit.

Concurrent assessment and relationship with other units

9.5)

For optimisation of training and assessment effort, competency development in this unit may be arranged concurrently with unit:

UEENEEK103A	Conduct periodic maintenance of remote area power supply battery banks
UEENEEK104A	Conduct periodic maintenance of remote area power supply generator sets
UEENEEK105A	Conduct periodic maintenance of remote area power supply photo voltaic arrays

The critical aspects of occupational health and safety covered in unit UEENEEE101A and other discipline specific occupational health and safety units shall be incorporated in relation to this unit.

Range Statement

RANGE STATEMENT

10) This relates to the unit as a whole providing the range of contexts and conditions to which the performance criteria apply. It allows for different work environments and situations that will affect performance.

This unit must be demonstrated in relation to at least two different RAPS systems in which the battery bank is charged from a generator set and a wind generator.

Generic terms used throughout this Vocational Standard shall be regarded as part of the Range Statement in which competency is demonstrated. The definition of these and other terms that apply are given in Volume 2, Part 2.1.

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Unit Sector(s)

Not applicable.

Competency Field

Competency Field **11)**

Renewable and Sustainable Energy

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UEENEEK111A Assemble and connect remote area power supplies

Modification History

Not applicable.

Unit Descriptor

Unit Descriptor **1) Scope:**

1.1) Descriptor

This unit covers installation of remote area power supply (RAPS) systems where the exposed voltage is not greater than 50 V a.c. or 120 V d.c. It encompasses working safely and to installation standards, matching equipment with that specified for a given location, placing and securing equipment accurately, making required circuit connections and completing the necessary installation documentation.

Application of the Unit

Application of the Unit **2)**

This unit is intended for competency development entry-level employment-based programs incorporated in approved contracts of training.

Licensing/Regulatory Information

License to practice **3)**

The skills and knowledge described in this unit do not require a license to practice in the workplace. However, practice in this unit is subject to regulations directly related to occupational health and safety and contracts of training such as new apprenticeships.

Note:

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License to practice **3)**

1. Compliance with permits may be required in various jurisdictions and typically relates to the operation of plant, machinery and equipment such as elevating work platforms, powder operated fixing tools, power operated tools, vehicles, road signage and traffic control and lifting equipment. Permits may also be required for some work environments such as confined spaces, working aloft, near live electrical apparatus and site rehabilitation.

2. Compliance may be required in various jurisdictions relating to currency in First Aid, confined space, lifting, risk safety measures etc

Pre-Requisites

Prerequisite Unit(s) **4)**

Competencies **4.1)**

Granting competency in this unit shall be made only after competency in the following unit(s) has/have been confirmed.

UEENEEE101A	Apply Occupational Health and Safety regulations, codes and practices in the workplace
UEENEEE102A	Fabricate, assemble and dismantle utilities industry components
UEENEEE107A	Use drawings, diagrams, schedules, standards, codes and specifications
UEENEEE108A	Lay wiring/cabling and terminate accessories for extra-low voltage (ELV) circuits

And

UEENEEE131A	Solve problems in ELV circuits for non electrical workers

OR

UEENEEE1	Solve problems in d.c. circuits

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Prerequisite Unit(s) **4)**

04A

Literacy and numeracy skills **4.2)**

Participants are best equipped to achieve competency in this unit if they have reading, writing and numeracy skills indicated by the following scales. Description of each scale is given in Volume 2, Part 3 'Literacy and Numeracy'

Reading 3 Writing 3 Numeracy 3

Employability Skills Information

Employability Skills **5)**

The required outcomes described in this unit of competency contain applicable facets of Employability Skills. The Employability Skills Summary of the qualification in which this unit of competency is packaged will assist in identifying Employability Skill requirements.

Elements and Performance Criteria Pre-Content

6) Elements describe the essential outcomes of a competency standard unit

Performance Criteria describe the required performance needed to demonstrate achievement of the element. Assessment of performance is to be consistent with the Evidence Guide.

Elements and Performance Criteria

ELEMENT	PERFORMANCE CRITERIA
1 Prepare to install remote area power	1.1 OHS procedures for a given work area are identified, obtained and understood

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ELEMENT	PERFORMANCE CRITERIA	
supplies	1.2	Health and safety risks are identified, and established risk control measures and procedures are followed in preparation for the work
	1.3	Safety hazards that have not previously been identified are noted, and established risk control measures are implemented
	1.4	Installation of apparatus is prepared in consultation with others effected by the work and sequenced appropriately
	1.5	The nature and location of the work is determined from documentation or appropriate persons to establish the scope of work to be undertaken
	1.6	Locations of apparatus and associated equipment is planned within the constraints of the building structure, significants and regulations
	1.7	Advice is sought from appropriate persons to ensure the work is coordinated effectively with others
	1.8	Material needed for the installation work is obtained in accordance with established procedures and checked against job requirements
	1.9	Tools, equipment and testing devices needed for the installation work are obtained in accordance with established procedures and checked for correct operation and safety
	1.10	Preparatory work is checked to ensure no damage has occurred and that it complies with requirements
2 Install remote area power supplies	2.1	OHS risk control measures and procedures for carrying out the work are followed
	2.2	The need to test or measure live is determined in strict accordance with OHS requirements and when necessary conducted within established safety procedures
	2.3	Circuits/machines/plant are checked as being

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ELEMENT	PERFORMANCE CRITERIA	
		isolated where necessary in strict accordance OHS requirements and procedures
	2.4	Apparatus and associated equipment are installed to comply with technical standards and job specifications and requirements with sufficient access to affect terminations, adjustment and maintenance
	2.5	Wiring is terminated at apparatus and associated equipment in accordance with manufacturer specifications and functional and regulatory requirements
	2.6	Established methods for dealing with unexpected situations are discussed with appropriate person or persons and documented
	2.7	Unexpected situations are dealt with safely and with the approval of an authorised person.
	2.8	Ongoing checks of the quality of installed apparatus are undertaken in accordance with established procedures
	2.9	Apparatus installation is carried out efficiently without waste of materials or damage to apparatus, circuits, the surrounding environment or services and using sustainable energy principles
3 Complete maintenance work on battery banks and report	3.1	OHS work completion risk control measures and procedures are followed
	3.2	Work site is cleaned and made safe in accordance with established procedures
	3.3	Final checks are made so that the installed apparatus conforms to requirements
	3.4	‘As-installed’ apparatus and associated equipment is documented and appropriate person(s) notified in accordance with established procedures

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Required Skills and Knowledge

REQUIRED SKILLS AND KNOWLEDGE

8) This describes the essential skills and knowledge and their level, required for this unit.

Evidence must show that knowledge has been acquired of safe working practices and assembling and connecting remote area power supplies (RAPS).

All knowledge and skills detailed in this unit should be contextualised to current industry practices and technologies.

KS01-EK111A Remote area power supplies ELV installations requirements

Evidence shall show an understanding of requirements for Remote area power supplies ELV installations to an extent indicated by the following aspects:

Requirements for installation of wiring and equipment

Compliant methods for providing protection

Requirements for installation planning and selection of equipment

Testing and verification requirements

Documentation encompassing:

- results of tests conducted that comply with requirements and ensure the remote area power supplies ELV installation is safe, including any formal documents of the results of testing required by authorities.
- documents of periodic inspection and testing of remote area power supplies ELV wiring and equipment including any tagging, in accordance with requirements.

Evidence Guide

EVIDENCE GUIDE

9) This provides essential advice for assessment of the unit and must be read in conjunction with the performance criteria and the range statement of the unit and the Training Package Assessment Guidelines.

The Evidence Guide forms an integral part of this unit. It must be used in conjunction with all parts of this unit and performed in accordance with the Assessment

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EVIDENCE GUIDE

Guidelines of this Training Package.

Overview of Assessment **9.1)**

Longitudinal competency development approaches to assessment, such as Profiling, require data to be reliably gathered in a form that can be consistently interpreted over time. This approach is best utilised in Apprenticeship programs and reduces assessment intervention. It is the industry-preferred model for apprenticeships. However, where summative (or final) assessment is used it is to include the application of the competency in the normal work environment or, at a minimum, the application of the competency in a realistically simulated work environment. In some circumstances, assessment in part or full can occur outside the workplace. However, it must be in accordance with industry and regulatory policy.

Methods chosen for a particular assessment will be influenced by various factors. These include the extent of the assessment, the most effective locations for the assessment activities to take place, access to physical resources, additional safety measures that may be required and the critical nature of the competencies being assessed.

The critical safety issues inherent in working with electricity, electrical equipment, gas or any other hazardous substance/material present a challenge for those determining competence. Sources of evidence need to be ‘rich’ in nature to minimise error in judgment.

Activities associated with normal everyday work have a bearing on the decision as to how much and how detailed the data gathered will contribute to its ‘richness’. Some skills are more critical to safety and operational requirements while the same skills may be more or less frequently practised. These points are raised for the assessors to consider when choosing an assessment method and developing assessment instruments. Sample assessment instruments are included for Assessors in the Assessment Guidelines of this Training Package.

Critical aspects of evidence required to demonstrate **9.2)**

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competency in this unit

Before the critical aspects of evidence are considered all prerequisites must be met.

Evidence for competence in this unit must be considered holistically. Each element and associated performance criteria must be demonstrated on at least two occasions in accordance with the 'Assessment Guidelines – UEE11'. Evidence must also comprise:

- A representative body of work performance demonstrated within the timeframes typically expected of the discipline, work function and industrial environment. In particular this must incorporate evidence that shows a candidate is able to:
  - Implement Occupational Health and Safety workplace procedures and practices including the use of risk control measures as specified in the performance criteria and range statement
  - Apply sustainable energy principles and practices as specified in the performance criteria and range statement
  - Demonstrate an understanding of the essential knowledge and associated skills as described in this unit. It may be required by some jurisdictions that RTOs provide a percentile graded result for the purpose of regulatory or licensing requirements.
  - Demonstrate an appropriate level of skills enabling employment
  - Conduct work observing the relevant Anti Discrimination legislation, regulations, polices and workplace procedures
- Demonstrated consistent performance across a representative range of contexts from the prescribed items below:
  - Assemble and connect remote area power supplies (RAPS) as described in 8) and including:

A Reading and interpreting drawings related to and apparatus locations and circuit connections.

B Placing and securing apparatus accurately

C Maintaining fire integrity

D Connecting apparatus and associated equipment to comply with requirements

E Dealing with unplanned events by drawing on essential knowledge and skills to provide appropriate solutions incorporated in a holistic

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assessment with the above listed items

Note:

Successful completion of relevant vendor training may be used to contribute to evidence on which competency is deemed. In these cases the alignment of outcomes of vendor training with performance criteria and critical aspects of evidence must be clearly identified

Context of and specific resources for assessment **9.3)**

This unit should be assessed as it relates to normal work practice using procedures, information and resources typical of a workplace. This should include:

- OHS policy and work procedures and instructions.
- Suitable work environment, facilities, equipment and materials to undertake actual work as prescribed by this unit.

These should be part of the formal learning/assessment environment.

Note:

Where simulation is considered a suitable strategy for assessment, conditions must be authentic and as far as possible reproduce and replicate the workplace and be consistent with the approved industry simulation policy.

The resources used for assessment should reflect current industry practices in relation to assembling and connecting remote area power supplies (RAPS).

Method of assessment **9.4)**

This unit shall be assessed by methods given in Volume 1, Part 3 ‘Assessment Guidelines’.

Note:

Competent performance with inherent safe working practices is expected in the Industry to which this unit applies. This requires

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assessment in a structured environment which is intended primarily for learning/assessment and incorporates all necessary equipment and facilities for learners to develop and demonstrate the essential knowledge and skills described in this unit.

Concurrent assessment and relationship with other units

9.5)

For optimisation of training and assessment effort, competency development in this unit may be arranged concurrently with unit:

UEENEEK104A	Conduct periodic maintenance of remote area power supply generator sets
UEENEEK105A	Conduct periodic maintenance of remote area power supply photo voltaic arrays
UEENEEK107A	Conduct checks in the demand side use of remote area power supplies (RAPS)

Range Statement

RANGE STATEMENT

10) This relates to the unit as a whole providing the range of contexts and conditions to which the performance criteria apply. It allows for different work environments and situations that will affect performance.

This unit must be demonstrated in relation to least two different RAPS systems in which the battery bank is charged from a generator set and a photo voltaic array and at least one similar RAPS system where the battery bank is charged form a wind generator.

Generic terms used throughout this Vocational Standard shall be regarded as part of the Range Statement in which competency is demonstrated. The definition of these and other terms that apply are given in Volume 2, Part 2.1.

Unit Sector(s)

Not applicable.

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Competency Field

Competency Field **11)**

Renewable and Sustainable Energy

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UEENEEK112A Provide basic sustainable energy solutions for energy reduction in residential premises

Modification History

Not applicable.

Unit Descriptor

Unit Descriptor **1) Scope:**

1.1) Descriptor

This unit covers monitoring energy use and providing basic sustainable energy options to reduce the energy consumption in residential premises. It encompasses working safely and providing basic sustainable energy solutions for energy reduction in domestic premises.

Application of the Unit

Application of the Unit **2)**

This unit shall apply to persons entering work in electrotechnology and may be used in school-based vocational programs.

Licensing/Regulatory Information

License to practice **3)**

The skills and knowledge described in this unit do not require a license to practice in the workplace. However, practice in this unit is subject to regulations directly related to occupational health and safety and contracts of training such as new apprenticeships.

Note:

1. Compliance with permits may be required in various jurisdictions and typically relates to the operation of plant, machinery and equipment such as elevating work

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License to practice **3)**

platforms, powder operated fixing tools, power operated tools, vehicles, road signage and traffic control and lifting equipment. Permits may also be required for some work environments such as confined spaces, working aloft, near live electrical apparatus and site rehabilitation.

2. Compliance may be required in various jurisdictions relating to currency in First Aid, confined space, lifting, risk safety measures etc

Pre-Requisites

Prerequisite Unit(s) **4)**

Competencies **4.1)**

There are no prerequisite competencies for this unit.

Literacy and numeracy skills **4.2)**

Participants are best equipped to achieve competency in this unit if they have reading, writing and numeracy skills indicated by the following scales. Description of each scale is given in Volume 2, Part 3 ‘Literacy and Numeracy’

Reading 3 Writing 3 Numeracy 3

Employability Skills Information

Employability Skills **5)**

The required outcomes described in this unit of competency contain applicable facets of Employability Skills. The Employability Skills Summary of the qualification in which this unit of competency is packaged will assist in identifying Employability Skill requirements.

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Elements and Performance Criteria Pre-Content

6) Elements describe the essential outcomes of a competency standard unit	Performance Criteria describe the required performance needed to demonstrate achievement of the element. Assessment of performance is to be consistent with the Evidence Guide.

Elements and Performance Criteria

ELEMENT		PERFORMANCE CRITERIA	
1	Prepare to monitor energy usage and provide basic solutions for energy reduction	1.1	Monitoring activities are planned and prepared for to ensure OHS policies and procedures are followed with the work appropriately sequenced in accordance with requirements
		1.2	Appropriate personnel are consulted to ensure the work is coordinated effectively with others involved
		1.3	Materials are obtained and checked in accordance with established procedures and to comply with requirements
		1.4	Location in which monitoring activities are to be undertaken is determined from job requirements
		1.5	Materials necessary to complete the work are obtained in accordance with established procedures and checked against job requirements
		1.6	Materials needed to carry out the monitoring are obtained in accordance with established procedures
2	Undertake monitoring of energy usage and provide basic solutions for energy reduction	2.1	OHS policies and procedures for undertaking monitoring activities are followed
		2.2	Monitoring activities are undertaken in accordance with requirements, without damage or distortion to the surrounding environment or services
		2.3	Unplanned events or conditions are responded to in accordance with established procedures

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ELEMENT		PERFORMANCE CRITERIA	
		2.4	Approval is obtained in accordance with established procedures from appropriate personnel before any contingencies are implemented
		2.5	Ongoing checks of the quality of the work are carried out in accordance with established procedures
3	Complete monitoring activities and provide and provide reports where necessary	3.1	Documentation/reports are completed to ensure administrative requirements are met
		3.2	Work completion is notified in accordance with established procedures

Required Skills and Knowledge

REQUIRED SKILLS AND KNOWLEDGE

8) This describes the essential skills and knowledge and their level, required for this unit.

Evidence must show that knowledge has been acquired of safe working practices and providing basic sustainable energy solutions for energy reduction in domestic premises.

All knowledge and skills detailed in this unit should be contextualised to current industry practices and technologies.

KS01-EK112A **Concepts of renewable energy**

Evidence shall show an understanding of concepts of renewable energy to an extent indicated by the following aspects:

T1 Non-technical issues encompassing:

- current economic, social, environmental and political issues, impact on a renewable energy technology

T2 Energy services/demand encompassing:

- terminology
- energy, power, temperature, symbols, units

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REQUIRED SKILLS AND KNOWLEDGE

- energy conversion and efficiency
- domestic dwelling: energy services and energy demand of individual appliance,
- energy efficient appliances
- primary energy and end use energy
- embodied energy

T3 Solar radiation resource encompassing:

- terminology
- units, symbols, conversions
- sun path diagrams
- solar contour maps
- solar window

T4 Solar thermal systems encompassing:

- terminology
- components
- applications
- types of hot water systems

T5 Photovoltaic arrays encompassing:

- terminology
- current, voltage and power
- modules: types, efficiency, applications
- IV curve
- irradiance and temperature effects
- array configurations

T6 Wind energy resource and technology encompassing:

- terminology, units, symbols
- wind speed, direction, turbulence, wind power,
- vertical wind speed profile (wind shear)
- local terrain roughness
- isovent maps
- measuring instruments
- Wind Energy Conversion Systems (WECS)
- terminology
- characteristics
- applications

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REQUIRED SKILLS AND KNOWLEDGE

T7 Micro-hydro resource and technology encompassing:

- terminology, units, symbols
- flow rate, head, assessment
- turbine types and applications

T8 Stand-alone power system configuration encompassing:

- basic configuration series systems
- components: functions, efficiencies; regulators, inverters, battery chargers, generators

Evidence Guide

EVIDENCE GUIDE

9) This provides essential advice for assessment of the unit and must be read in conjunction with the performance criteria and the range statement of the unit and the Training Package Assessment Guidelines.

The Evidence Guide forms an integral part of this unit. It must be used in conjunction with all parts of this unit and performed in accordance with the Assessment Guidelines of this Training Package.

Overview of Assessment **9.1)**

Longitudinal competency development approaches to assessment, such as Profiling, require data to be reliably gathered in a form that can be consistently interpreted over time. This approach is best utilised in Apprenticeship programs and reduces assessment intervention. It is the industry-preferred model for apprenticeships. However, where summative (or final) assessment is used it is to include the application of the competency in the normal work environment or, at a minimum, the application of the competency in a realistically simulated work environment. In some circumstances, assessment in part or full can occur outside the workplace. However, it must be in accordance with industry and regulatory policy.

Methods chosen for a particular assessment will be influenced by various factors. These include the extent of the assessment, the most effective locations for the assessment activities to take place, access to physical resources, additional safety measures that may

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be required and the critical nature of the competencies being assessed.

The critical safety issues inherent in working with electricity, electrical equipment, gas or any other hazardous substance/material present a challenge for those determining competence. Sources of evidence need to be 'rich' in nature to minimise error in judgment.

Activities associated with normal everyday work have a bearing on the decision as to how much and how detailed the data gathered will contribute to its 'richness'. Some skills are more critical to safety and operational requirements while the same skills may be more or less frequently practised. These points are raised for the assessors to consider when choosing an assessment method and developing assessment instruments. Sample assessment instruments are included for Assessors in the Assessment Guidelines of this Training Package.

Critical aspects of evidence required to demonstrate competency in this unit

9.2)

Before the critical aspects of evidence are considered all prerequisites must be met.

Evidence for competence in this unit must be considered holistically. Each element and associated performance criteria must be demonstrated on at least two occasions in accordance with the 'Assessment Guidelines – UEE11'. Evidence must also comprise:

- A representative body of work performance demonstrated within the timeframes typically expected of the discipline, work function and industrial environment. In particular this must incorporate evidence that shows a candidate is able to:
  - Implement Occupational Health and Safety workplace procedures and practices including the use of risk control measures as specified in the performance criteria and range statement
  - Apply sustainable energy principles and practices as specified in the performance criteria and range statement
  - Demonstrate an understanding of the essential knowledge and associated skills as described in this unit. It may be required by some jurisdictions that RTOs provide a

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percentile graded result for the purpose of regulatory or licensing requirements.

- Demonstrate an appropriate level of skills enabling employment
- Conduct work observing the relevant Anti Discrimination legislation, regulations, polices and workplace procedures

- Demonstrated consistent performance across a representative range of contexts from the prescribed items below:
  - Provide basic sustainable energy solutions for energy reduction in domestic premises as described in 8) and including:

A Providing basic sustainable energy solutions for energy reduction in domestic premises

B Dealing with unplanned events by drawing on essential knowledge and skills to provide appropriate solutions incorporated in a holistic assessment with the above listed items

Note:

Successful completion of relevant vendor training may be used to contribute to evidence on which competency is deemed. In these cases the alignment of outcomes of vendor training with performance criteria and critical aspects of evidence must be clearly identified

Context of and specific resources for assessment

9.3)

This unit should be assessed as it relates to normal work practice using procedures, information and resources typical of a workplace. This should include:

- OHS policy and work procedures and instructions.
- Suitable work environment, facilities, equipment and materials to undertake actual work as prescribed by this unit.

These should be part of the formal learning/assessment environment.

Note:

Where simulation is considered a suitable strategy for assessment,

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conditions must be authentic and as far as possible reproduce and replicate the workplace and be consistent with the approved industry simulation policy.

The resources used for assessment should reflect current industry practices in relation to providing basic sustainable energy solutions for energy reduction in domestic premises.

Method of assessment

9.4)

This unit shall be assessed by methods given in Volume 1, Part 3 'Assessment Guidelines'.

Note:

Competent performance with inherent safe working practices is expected in the Industry to which this unit applies. This requires assessment in a structured environment which is intended primarily for learning/assessment and incorporates all necessary equipment and facilities for learners to develop and demonstrate the essential knowledge and skills described in this unit.

Concurrent assessment and relationship with other units

9.5)

There are no concurrent assessment recommendations for this unit.

Range Statement

RANGE STATEMENT

10) This relates to the unit as a whole providing the range of contexts and conditions to which the performance criteria apply. It allows for different work environments and situations that will affect performance.

This unit must be demonstrated in relation to the provision of basic sustainable energy solutions for energy reduction in domestic premises in any of the following disciplines:

- Appliances
- Business equipment
- Computers

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RANGE STATEMENT

- Data Communications
- Electrical
- Electrical Machines
- Electronics
- Fire protection
- Instrumentation
- Refrigeration and Air Conditioning
- Renewable / sustainable energy
- Security technology

Generic terms used throughout this Vocational Standard shall be regarded as part of the Range Statement in which competency is demonstrated. The definition of these and other terms that apply are given in Volume 2, Part 2.1.

Unit Sector(s)

Not applicable.

Competency Field

Competency Field **11)**

Renewable and Sustainable Energy

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UEENEEK114A Promote sustainable energy practices in the community

Modification History

Not applicable.

Unit Descriptor

Unit Descriptor **1) Scope:**

1.1) Descriptor

This unit covers the promotion of recognised, safe, sustainable energy practices to others in the community.

Application of the Unit

Application of the Unit **2)**

This unit shall apply to persons entering work in electrotechnology and may be used in school-based vocational programs.

Licensing/Regulatory Information

License to practice **3)**

The skills and knowledge described in this unit do not require a license to practice in the workplace. However, practice in this unit is subject to regulations directly related to occupational health and safety and contracts of training such as new apprenticeships.

Note:

1. Compliance with permits may be required in various jurisdictions and typically relates to the operation of plant, machinery and equipment such as elevating work platforms, powder operated fixing tools, power operated tools, vehicles, road signage and traffic control and lifting equipment. Permits may also be required for some work

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License to practice **3)**

environments such as confined spaces, working aloft, near live electrical apparatus and site rehabilitation.

2. Compliance may be required in various jurisdictions relating to currency in First Aid, confined space, lifting, risk safety measures etc

Pre-Requisites

Prerequisite Unit(s) **4)**

Competencies **4.1)**

There are no prerequisite competencies for this unit.

Literacy and numeracy skills **4.2)**

Participants are best equipped to achieve competency in this unit if they have reading, writing and numeracy skills indicated by the following scales. Description of each scale is given in Volume 2, Part 3 ‘Literacy and Numeracy’

Reading 3 Writing 3 Numeracy 3

Employability Skills Information

Employability Skills **5)**

The required outcomes described in this unit of competency contain applicable facets of Employability Skills. The Employability Skills Summary of the qualification in which this unit of competency is packaged will assist in identifying Employability Skill requirements.

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Elements and Performance Criteria Pre-Content

6) Elements describe the essential outcomes of a competency standard unit	Performance Criteria describe the required performance needed to demonstrate achievement of the element. Assessment of performance is to be consistent with the Evidence Guide.

Elements and Performance Criteria

ELEMENT		PERFORMANCE CRITERIA	
1	Plan and prepare to promote sustainable energy practice	1.1	Activities are planned and prepared to ensure OHS policies and procedures are followed with the work appropriately sequenced in accordance with requirements
		1.2	Appropriate personnel are consulted to ensure the work is coordinated effectively with others involved
		1.3	Materials are obtained and checked in accordance with established procedures and to comply with requirements
		1.4	Location in which activities are to be undertaken is determined from requirements
		1.5	Materials necessary to complete the work are obtained in accordance with established procedures and checked against job requirements
2	Promote sustainable energy practice	2.1	OHS policies and procedures for undertaking administrative functions are followed
		2.2	Activities are undertaken in accordance with requirements without damage or distortion to the surrounding environment or services
		2.3	Unplanned events or conditions are responded to in accordance with established procedures
		2.4	Approval is obtained in accordance with established procedures from appropriate personnel before any contingencies are implemented

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ELEMENT	PERFORMANCE CRITERIA	
	2.5	Ongoing checks of the quality of the work are undertaken in accordance with established procedures
3 Complete the promotion of sustainable energy	3.1	Documentation/reports are completed to ensure detailed promotional activities requirements are met
	3.2	Completion is notified in accordance with established procedure

Required Skills and Knowledge

REQUIRED SKILLS AND KNOWLEDGE

8) This describes the essential skills and knowledge and their level, required for this unit.

Evidence must show that knowledge has been acquired of safe working practices and promoting sustainable energy practices in the community.

All knowledge and skills detailed in this unit should be contextualised to current industry practices and technologies.

KS01-EK114A **Greenhouse reduction strategies**

Evidence shall show an understanding of greenhouse gas reduction strategies to an extent indicated by the following aspects:

T1 Greenhouse gas emissions profile encompassing:

- goals and principles of the National Greenhouse Strategy
- what a greenhouse gas inventory is, why it is required, and the sectors to which it applies
- uses to which the National Greenhouse Gas Inventory can be applied.

T2 Understanding and communicating climate change and its impacts encompassing:

- the possible impact of climate change in Australia.
- techniques for improving the understanding of climate change
- techniques for communicating to and educating the general public on greenhouse gas induced climate change.

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REQUIRED SKILLS AND KNOWLEDGE

T3 Partnerships for greenhouse action encompassing:

- actions achievable by each level of government to implement the NGS.
- methods by which the community activity can be engaged in the reduction of greenhouse gas emissions.
- initiatives that can be undertaken by the private sector to reduce greenhouse gas emissions.
- advantages of international partnerships.
- emissions trading system.

T4 Efficient and sustainable energy use and supply encompassing:

- techniques for reducing the greenhouse intensity of energy supply.
- types of renewable energy sources suitable for use in Australia.
- methods and technique for improving end-use efficiency.

T5 Efficient transport and sustainable urban planning encompassing:

- how integrating land use and transport planning can assist the greenhouse problem.
- how each of the following can be used to mitigate greenhouse gas; travel demand and traffic management strategies; encouraging greater use of public transport, walking and cycling; freight and logistics systems; improving vehicle fuel efficiency and fuel technologies;

T6 Greenhouse sinks and sustainable land management encompassing:

- how enhancing greenhouse sinks and encouraging sustainable forestry and vegetation management can complement the AGS.
- how greenhouse gas emissions are obtained from agricultural production and describe techniques to mitigate the emissions.

T7 Models of greenhouse best practice in industrial processes and waste management encompassing:

- types and methods of reducing greenhouse gas emissions from industry.
- methods of reducing methane emissions from waste treatment and disposal.

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REQUIRED SKILLS AND KNOWLEDGE

T8 Adaptation to climate change encompassing:

- salient points in each of the key sectors that require analysis and the strategies required in the need for adaptation to climate change

Evidence Guide

EVIDENCE GUIDE

9) This provides essential advice for assessment of the unit and must be read in conjunction with the performance criteria and the range statement of the unit and the Training Package Assessment Guidelines.

The Evidence Guide forms an integral part of this unit. It must be used in conjunction with all parts of this unit and performed in accordance with the Assessment Guidelines of this Training Package.

Overview of Assessment **9.1)**

Longitudinal competency development approaches to assessment, such as Profiling, require data to be reliably gathered in a form that can be consistently interpreted over time. This approach is best utilised in Apprenticeship programs and reduces assessment intervention. It is the industry-preferred model for apprenticeships. However, where summative (or final) assessment is used it is to include the application of the competency in the normal work environment or, at a minimum, the application of the competency in a realistically simulated work environment. In some circumstances, assessment in part or full can occur outside the workplace. However, it must be in accordance with industry and regulatory policy.

Methods chosen for a particular assessment will be influenced by various factors. These include the extent of the assessment, the most effective locations for the assessment activities to take place, access to physical resources, additional safety measures that may be required and the critical nature of the competencies being assessed.

The critical safety issues inherent in working with electricity, electrical equipment, gas or any other hazardous substance/material present a challenge for those determining

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competence. Sources of evidence need to be 'rich' in nature to minimise error in judgment.

Activities associated with normal everyday work have a bearing on the decision as to how much and how detailed the data gathered will contribute to its 'richness'. Some skills are more critical to safety and operational requirements while the same skills may be more or less frequently practised. These points are raised for the assessors to consider when choosing an assessment method and developing assessment instruments. Sample assessment instruments are included for Assessors in the Assessment Guidelines of this Training Package.

Critical aspects of evidence required to demonstrate competency in this unit

9.2)

Before the critical aspects of evidence are considered all prerequisites must be met.

Evidence for competence in this unit must be considered holistically. Each element and associated performance criteria must be demonstrated on at least two occasions in accordance with the 'Assessment Guidelines – UEE11'. Evidence must also comprise:

- A representative body of work performance demonstrated within the timeframes typically expected of the discipline, work function and industrial environment. In particular this must incorporate evidence that shows a candidate is able to:
  - Implement Occupational Health and Safety workplace procedures and practices including the use of risk control measures as specified in the performance criteria and range statement
  - Apply sustainable energy principles and practices as specified in the performance criteria and range statement
  - Demonstrate an understanding of the essential knowledge and associated skills as described in this unit. It may be required by some jurisdictions that RTOs provide a percentile graded result for the purpose of regulatory or licensing requirements.
  - Demonstrate an appropriate level of skills enabling employment
  - Conduct work observing the relevant Anti Discrimination

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legislation, regulations, polices and workplace procedures

- Demonstrated consistent performance across a representative range of contexts from the prescribed items below:
  - Promote sustainable energy practices in the community as described in 8) and including:

A Applying sustainable energy practice in the community

B Dealing with unplanned events by drawing on essential knowledge and skills to provide appropriate solutions incorporated in a holistic assessment with the above listed items

Note:

Successful completion of relevant vendor training may be used to contribute to evidence on which competency is deemed. In these cases the alignment of outcomes of vendor training with performance criteria and critical aspects of evidence must be clearly identified

Context of and specific resources for assessment

9.3)

This unit should be assessed as it relates to normal work practice using procedures, information and resources typical of a workplace. This should include:

- OHS policy and work procedures and instructions.
- Suitable work environment, facilities, equipment and materials to undertake actual work as prescribed by this unit.

These should be part of the formal learning/assessment environment.

Note:

Where simulation is considered a suitable strategy for assessment, conditions must be authentic and as far as possible reproduce and replicate the workplace and be consistent with the approved industry simulation policy.

The resources used for assessment should reflect current industry practices in relation to promoting sustainable energy practices in

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the community.

Method of assessment **9.4)**

This unit shall be assessed by methods given in Volume 1, Part 3 'Assessment Guidelines'.

Note:

Competent performance with inherent safe working practices is expected in the Industry to which this unit applies. This requires assessment in a structured environment which is intended primarily for learning/assessment and incorporates all necessary equipment and facilities for learners to develop and demonstrate the essential knowledge and skills described in this unit.

Concurrent assessment and relationship with other units **9.5)**

There are no concurrent assessment recommendations for this unit.

Range Statement

RANGE STATEMENT

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RANGE STATEMENT

10) This relates to the unit as a whole providing the range of contexts and conditions to which the performance criteria apply. It allows for different work environments and situations that will affect performance.

This unit must be demonstrated in relation to promoting sustainable energy practice in the community in any of the following disciplines:

- Appliances
- Business equipment
- Computers
- Data Communications
- Electrical
- Electrical Machines
- Electronics
- Fire protection
- Instrumentation
- Refrigeration and Air Conditioning
- Renewable/sustainable energy
- Security technology

Generic terms used throughout this Vocational Standard shall be regarded as part of the Range Statement in which competency is demonstrated. The definition of these and other terms that apply are given in Volume 2, Part 2.1.

Unit Sector(s)

Not applicable.

Competency Field

Competency Field **11)**

Renewable and Sustainable Energy

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UEENEEK116A Maintain and repair remote area power generation facilities

Modification History

Release	Action	Core/Elective	Details	Points
2	Edit		Show full pre-req chain in the unit	

Unit Descriptor

Unit Descriptor **1) Scope:**

1.1) Descriptor

This unit covers basic maintenance of power generation facilities in remote areas It encompasses working safely, following maintenance schedules to inspect, repair, replace and adjustment equipment, maintaining a clean and efficient generation facility and completing the necessary reporting.

Application of the Unit

Application of the Unit **2)**

This unit is intended primarily for indigenous persons seeking qualifications in remote area utilities facilities servicing. The unit may also be applied to work entry qualifications in renewable energy service work in general and be used in school-based vocational programs.

Licensing/Regulatory Information

License to practice **3)**

The skills and knowledge described in this unit do not require a license to practice in the workplace. However,

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License to practice **3)**

practice in this unit is subject to regulations directly related to occupational health and safety and contracts of training such as new apprenticeships.

Note:

1. Compliance with permits may be required in various jurisdictions and typically relates to the operation of plant, machinery and equipment such as elevating work platforms, powder operated fixing tools, power operated tools, vehicles, road signage and traffic control and lifting equipment. Permits may also be required for some work environments such as confined spaces, working aloft, near live electrical apparatus and site rehabilitation.

2. Compliance may be required in various jurisdictions relating to currency in First Aid, confined space, lifting, risk safety measures etc

Pre-Requisites

Prerequisite Unit(s) **4)**

Competencies **4.1)**

Granting competency in this unit shall be made only after competency in the following unit(s) has/have been confirmed.

Granting competency in this unit shall be made only after competency in the following unit(s) has/have been confirmed.

Where pre-requisite pathways have been identified. All competencies in the Common Unit Group must be have been completed plus all the competencies in one (1) of the identified Pathway Unit Group(s):

Electrotechnology

Remote Area

Common Unit Group

UEENEEE101A	Apply Occupational Health and Safety regulations, codes and practices in the workplace

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Prerequisite Unit(s) **4)**

UEENEEE102A	Fabricate, assemble and dismantle utilities industry components
UEENEEE107A	Use drawings, diagrams, schedules, standards, codes and specifications
UEENEEK101A	Maintain safety and tidiness of remote area power supply systems
UEENEEK102A	Work safely with remote area power supply systems
UEENEEK104A	Conduct periodic maintenance of remote area power supply generator sets

Electrotechnology Pathway Group

UEENEEE104A	Solve problems in d.c. Circuits

Remote Area Pathway Group

UEENEEE131A	Solve problems in ELV circuits for non electrical workers

Literacy and numeracy skills **4.2)**

Participants are best equipped to achieve competency in this unit if they have reading, writing and numeracy skills indicated by the following scales. Description of each scale is given in Volume 2, Part 3 ‘Literacy and Numeracy’

Reading 3 Writing 3 Numeracy 3

Employability Skills Information

Employability Skills **5)**

The required outcomes described in this unit of competency contain applicable facets of Employability Skills. The Employability Skills Summary of the

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Employability Skills	**5)** qualification in which this unit of competency is packaged will assist in identifying Employability Skill requirements.

Elements and Performance Criteria Pre-Content

6) Elements describe the essential outcomes of a competency standard unit	Performance Criteria describe the required performance needed to demonstrate achievement of the element. Assessment of performance is to be consistent with the Evidence Guide.

Elements and Performance Criteria

ELEMENT	PERFORMANCE CRITERIA
1 Prepare to maintain and repair remote area power generation facilities	1.1 OHS procedures for a remote area power station facility are identified, obtained and understood through established routines and procedures
	1.2 Established OHS risk control measures and procedures in preparation for the work are followed
	1.3 Safety hazards which have not previously been identified are reported and advice on risk control measures is sought from the work supervisor
	1.4 The nature and location of remote area power station facility is obtained from documentation or from work supervisor to establish the scope of work to be undertaken
	1.5 Advice is sought from the work supervisor to ensure the work is coordinated effectively with fellow workers and the local community
	1.6 Sources of materials that may be required for the work are identified and accessed in accordance with established routines and procedures
	1.7 Tools, equipment and testing devices needed to carry out the work are obtained and checked for

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ELEMENT	PERFORMANCE CRITERIA	
		correct operation and safety.
2 Maintain and repair remote area power generation facilities	2.1	Established OHS risk control measures and procedures for carrying out the work are followed
	2.2	Circuits/machines/plant are checked as being isolated where necessary in strict accordance OHS requirements and procedures
	2.2	Inspection, repairs, replacements and/or adjustments are carried out on items listed in the maintenance schedule and in accordance with established procedures.
	2.3	Fuel, coolant, oil and other fluid spills are cleaned and area made safe in accordance with established procedures.
	2.4	Batteries are serviced and/or replaced as specified in the maintenance schedule and in accordance with established procedures.
	2.5	Consumables are removed and disposed of following environmentally safe procedures.
	2.6	Procedures are followed for referring non-routine events to immediate supervisor for directions
	2.7	Routine quality checks are carried out in accordance with work instructions
3 Report maintenance and repair of remote area power generation facilities	3.1	OHS work completion risk control measures and procedures are followed.
	3.2	Procedures are followed for referring maintenance issues beyond the scope of prescribed work to persons of higher authority.
	3.3	Work carried out is reported to the work supervisor through the established maintenance reporting procedures.

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Required Skills and Knowledge

REQUIRED SKILLS AND KNOWLEDGE

8) This describes the essential skills and knowledge and their level, required for this unit.

Evidence must show that knowledge has been acquired of safe working practices and maintaining and repairing facilities associated with remote area essential service operations.

All knowledge and skills detailed in this unit should be contextualised to current industry practices and technologies.

KS01-EK116A Remote area essential services power plant

Evidence shall show an understanding of remote area essential services power plant to an extend indicated by the following aspects:

Minor service and maintenance procedures of diesel powered generation equipment in accordance with a prepared schedule encompassing:

- Types and grades of inspections, repairs, replacement and/or adjustments under a maintenance schedule:
  - Replacement items/materials include engine oil, oil filters, fuel filters, engine coolant system filters, air cleaners and fan belts;
  - Inspection and repair items include leakages from fuel system, coolant system and lubricating oil system.
- Cleaning of fluid spills.
- Environmentally safe procedures for removal and disposal of consumables.

Servicing batteries and battery packs in a community power station in accordance with the prepared maintenance schedule encompassing:

- Hazards associated with batteries.
- Types of batteries and their application in a community power station (Starting battery set, switchboard (nicad) batteries)
- Battery maintenance techniques

Schedule regular servicing and maintenance encompassing:

- Engine oil and filter changes;
- Fuel filters;
- Coolant filters

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REQUIRED SKILLS AND KNOWLEDGE

- Water trap devices
- Drive belt (condition/adjustment);
- Valve adjustments (if applicable);
- Major and minor mechanical servicing by outside agents;
- Air cleaner (both dry paper and oil bath types)

Evidence Guide

EVIDENCE GUIDE

9) This provides essential advice for assessment of the unit and must be read in conjunction with the performance criteria and the range statement of the unit and the Training Package Assessment Guidelines.

The Evidence Guide forms an integral part of this unit. It must be used in conjunction with all parts of this unit and performed in accordance with the Assessment Guidelines of this Training Package.

Overview of Assessment **9.1)**

Longitudinal competency development approaches to assessment, such as Profiling, require data to be reliably gathered in a form that can be consistently interpreted over time. This approach is best utilised in Apprenticeship programs and reduces assessment intervention. It is the industry-preferred model for apprenticeships. However, where summative (or final) assessment is used it is to include the application of the competency in the normal work environment or, at a minimum, the application of the competency in a realistically simulated work environment. In some circumstances, assessment in part or full can occur outside the workplace. However, it must be in accordance with industry and regulatory policy.

Methods chosen for a particular assessment will be influenced by various factors. These include the extent of the assessment, the most effective locations for the assessment activities to take place, access to physical resources, additional safety measures that may be required and the critical nature of the competencies being assessed.

The critical safety issues inherent in working with electricity, electrical equipment, gas or any other hazardous

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substance/material present a challenge for those determining competence. Sources of evidence need to be 'rich' in nature to minimise error in judgment.

Activities associated with normal everyday work have a bearing on the decision as to how much and how detailed the data gathered will contribute to its 'richness'. Some skills are more critical to safety and operational requirements while the same skills may be more or less frequently practised. These points are raised for the assessors to consider when choosing an assessment method and developing assessment instruments. Sample assessment instruments are included for Assessors in the Assessment Guidelines of this Training Package.

Critical aspects of evidence required to demonstrate competency in this unit

9.2)

Before the critical aspects of evidence are considered all prerequisites must be met.

Evidence for competence in this unit must be considered holistically. Each element and associated performance criteria must be demonstrated on at least two occasions in accordance with the 'Assessment Guidelines – UEE11'. Evidence must also comprise:

- A representative body of work performance demonstrated within the timeframes typically expected of the discipline, work function and industrial environment. In particular this must incorporate evidence that shows a candidate is able to:
  - Implement Occupational Health and Safety workplace procedures and practices including the use of risk control measures as specified in the performance criteria and range statement
  - Apply sustainable energy principles and practices as specified in the performance criteria and range statement.
  - Demonstrate an understanding of the essential knowledge and associated skills as described in this unit. It may be required by some jurisdictions that RTOs provide a percentile graded result for the purpose of regulatory or licensing requirements.
  - Demonstrate an appropriate level of skills enabling employment

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- Conduct work observing the relevant Anti Discrimination legislation, regulations, polices and workplace procedures

- Demonstrated consistent performance across a representative range of contexts from the prescribed items below:
  - Maintain and repair remote area power generation facilities as described in 8) and including:

A Understanding the location and nature of the work required

B Correctly inspecting, repairing, replacing and adjusting items listed in the maintenance schedule

C Cleaning fluid spills appropriately.

D Removing and disposing of consumable following environmentally safe procedures.

E Documenting work activities accurately

F Dealing with unplanned events by drawing on essential knowledge and skills to provide appropriate solutions incorporated in a holistic assessment with the above listed items

Note:

Successful completion of relevant vendor training may be used to contribute to evidence on which competency is deemed. In these cases the alignment of outcomes of vendor training with performance criteria and critical aspects of evidence must be clearly identified

Context of and specific resources for assessment

9.3)

This unit should be assessed as it relates to normal work practice using procedures, information and resources typical of a workplace. This should include:

- OHS policy and work procedures and instructions.
- Suitable work environment, facilities, equipment and materials to undertake actual work as prescribed by this unit.

These should be part of the formal learning/assessment

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environment.

Note:

Where simulation is considered a suitable strategy for assessment, conditions must be authentic and as far as possible reproduce and replicate the workplace and be consistent with the approved industry simulation policy.

The resources used for assessment should reflect current industry practices in relation to maintaining and repairing facilities associated with remote area essential service operations.

Method of assessment

9.4)

This unit shall be assessed by methods given in Volume 1, Part 3 'Assessment Guidelines'.

Note:

Competent performance with inherent safe working practices is expected in the Industry to which this unit applies. This requires assessment in a structured environment which is intended primarily for learning/assessment and incorporates all necessary equipment and facilities for learners to develop and demonstrate the essential knowledge and skills described in this unit.

Concurrent assessment and relationship with other units

9.5)

There are no concurrent assessment recommendations for this unit.

The critical aspects of occupational health and safety covered in unit UEENEEE101A and other discipline specific occupational health and safety units shall be incorporated in relation to this unit.

Range Statement

RANGE STATEMENT

10) This relates to the unit as a whole providing the range of contexts and conditions to which the performance criteria apply. It allows for different work environments and

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RANGE STATEMENT

situations that will affect performance.

This unit must be demonstrated in relation to least two different remote area power generation facilities.

Generic terms used throughout this Vocational Standard shall be regarded as part of the Range Statement in which competency is demonstrated. The definition of these and other terms that apply are given in Volume 2, Part 2.1.

Unit Sector(s)

Not applicable.

Competency Field

Competency Field **11)**

Renewable and Sustainable Energy

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UEENEEK117A Maintain and repair facilities associated with remote area essential service operations

Modification History

Not applicable.

Unit Descriptor

Unit Descriptor **1) Scope:**

1.1) Descriptor

This unit covers basic maintenance of remote area infrastructure facilities. It encompasses working safely, to maintenance standards and following maintenance routines, identifying deterioration and damage to facilities using routine procedures, and completing the necessary maintenance reporting.

Application of the Unit

Application of the Unit **2)**

This unit is intended primarily for indigenous persons seeking qualifications in RAPS system servicing. The unit may also be applied to work entry qualifications in renewable energy service work in general and be used in school-based vocational programs.

Licensing/Regulatory Information

License to practice **3)**

The skills and knowledge described in this unit do not require a license to practice in the workplace. However, practice in this unit is subject to regulations directly related to occupational health and safety and contracts of training such as new apprenticeships.

Note:

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License to practice **3)**

1. Compliance with permits may be required in various jurisdictions and typically relates to the operation of plant, machinery and equipment such as elevating work platforms, powder operated fixing tools, power operated tools, vehicles, road signage and traffic control and lifting equipment. Permits may also be required for some work environments such as confined spaces, working aloft, near live electrical apparatus and site rehabilitation.

2. Compliance may be required in various jurisdictions relating to currency in First Aid, confined space, lifting, risk safety measures etc

Pre-Requisites

Prerequisite Unit(s) **4)**

Competencies **4.1)**

Granting competency in this unit shall be made only after competency in the following unit(s) has/have been confirmed.

UEENEEE101A	Apply Occupational Health and Safety regulations, codes and practices in the workplace
UEENEEE102A	Fabricate, assemble and dismantle utilities industry components
UEENEEE103A	Solve problems in ELV single path circuits

And

UEENEEE131A	Solve problems in ELV circuits for non electrical workers

OR

UEENEEE104A	Solve problems in d.c. circuits

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Literacy and numeracy skills **4.2)**

Participants are best equipped to achieve competency in this unit if they have reading, writing and numeracy skills indicated by the following scales. Description of each scale is given in Volume 2, Part 3 'Literacy and Numeracy'

Reading 3 Writing 3 Numeracy 3

Employability Skills Information

Employability Skills **5)**

The required outcomes described in this unit of competency contain applicable facets of Employability Skills. The Employability Skills Summary of the qualification in which this unit of competency is packaged will assist in identifying Employability Skill requirements.

Elements and Performance Criteria Pre-Content

6) Elements describe the essential outcomes of a competency standard unit

Performance Criteria describe the required performance needed to demonstrate achievement of the element. Assessment of performance is to be consistent with the Evidence Guide.

Elements and Performance Criteria

ELEMENT	PERFORMANCE CRITERIA
1 Prepare to maintain and repair facilities	1.1 OHS procedures for a RAPS plant are identified, obtained and understood through established routines and procedures
	1.2 Established OHS risk control measures and procedures in preparation for the work are followed

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ELEMENT		PERFORMANCE CRITERIA	
		1.3	Safety hazards which have not previously been identified are reported and advice on risk control measures is sought from the work supervisor
		1.4	The nature and location of service facilities is obtained from documentation or from work supervisor to establish the scope of work to be undertaken
		1.5	Advice is sought from the work supervisor to ensure the work is coordinated effectively with fellow workers and the local community
		1.6	Sources of materials that may be required for the work are identified and accessed in accordance with established routines and procedures
		1.7	Tools, equipment and testing devices needed to carry out the work are obtained and checked for correct operation and safety
2	Maintain and repair facilities	2.1	Established OHS risk control measures and procedures for carrying out the work are followed
		2.2	Circuits/machines/plant are checked as being isolated where necessary in strict accordance OHS requirements and procedures
		2.2	Prescribed procedures are used to check and identify deterioration and damage to facilities
		2.4	Faulty and damaged facilities are repaired using routine procedures
		2.5	Maintenance and repairs are carried out safely and within the prescribed limits, routines and procedures
		2.6	Procedures are followed for referring non-routine events to immediate supervisor for directions
		2.7	Maintenance and repair work is carried out efficiently without waste of materials and energy and without damage to apparatus, circuits, the surrounding environment or services

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ELEMENT	PERFORMANCE CRITERIA	
	2.8	Routine quality checks are carried out in accordance with work instructions
3 Complete maintenance and repair work report	3.1	OHS work completion risk control measures and procedures are followed
	3.2	Work site is cleaned and made safe in accordance with routine procedures
	3.3	Procedures are followed for referring maintenance issues beyond the scope of prescribed work to persons of higher authority
	3.4	Work carried out is reported to the work supervisor through the established maintenance reporting procedures

Required Skills and Knowledge

REQUIRED SKILLS AND KNOWLEDGE

8) This describes the essential skills and knowledge and their level, required for this unit.

Evidence must show that knowledge has been acquired of safe working practices and maintaining and repairing facilities associated with remote area essential service operations.

All knowledge and skills detailed in this unit should be contextualised to current industry practices and technologies.

KS01-EK117A Remote area essential services facilities

Evidence shall show an understanding of remote area essential services facilities to an extent indicated by the following aspects:

T1 Window repair and maintenance encompassing:

- Emergency repairs
- Louvre type
- Fixed pane type
- Shutters
- Safety awareness

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REQUIRED SKILLS AND KNOWLEDGE

T2 Repair and maintenance to fences and gates encompassing:

- Emergency repairs
- Locks and catches
- Security fencing
- Fence maintenance
- Gates
- Safety awareness

T3 Maintenance painting encompassing:

- Preparation of surfaces
- Block work
- Concrete
- Timber
- Steel
- Paint selection
- Brush and roller selection
- Paint application
- Clean up process
- Paint and accessories storage
- Safety awareness

T4 Essential services facilities lighting encompassing:

- Incandescent lamps
- Compact fluorescent lamps
- Fluorescent tubes
- Fluorescent light starters
- Diffusion devices
- Safety awareness
- Disposal of faulty lamps

T5 Essential services facilities safety and security and emergency checks encompassing:

- Broken windows
- Faulty lighting
- Damaged gates
- Logging the inspections
- Notification of the situation
- Safety awareness

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REQUIRED SKILLS AND KNOWLEDGE

T6 Telephone encompassing:

- Answer calls promptly and clearly.
- Using designated business protocol procedure
- Making and receiving telephone calls in a workplace context
- Obtain accurate telephone numbers from an appropriate source.
- Establish contact using designated business protocol procedures.
- Convey purpose all call clearly and concisely.

T7 Mathematical operations encompassing:

- Whole numbers.
- Fractions
- Decimals
- Percentages
- Ratios
- Proportions

T8 Electrical encompassing:

- Identification and basic function of electrical components used
- for generating and distributing.
- Electricity safety procedures when working with electricity.
- Identification of faulty electrical components.
- Reporting of faulty electrical components.

T9 Fire fighting equipment encompassing:

- Fire extinguishers and signage
- Types of fire extinguishers
- Contents and colour
- Correct identification
- Use of fire extinguishers
- Use of water hose and reel
- Safety awareness

Evidence Guide

EVIDENCE GUIDE

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EVIDENCE GUIDE

9) This provides essential advice for assessment of the unit and must be read in conjunction with the performance criteria and the range statement of the unit and the Training Package Assessment Guidelines.

The Evidence Guide forms an integral part of this unit. It must be used in conjunction with all parts of this unit and performed in accordance with the Assessment Guidelines of this Training Package.

Overview of Assessment **9.1)**

Longitudinal competency development approaches to assessment, such as Profiling, require data to be reliably gathered in a form that can be consistently interpreted over time. This approach is best utilised in Apprenticeship programs and reduces assessment intervention. It is the industry-preferred model for apprenticeships. However, where summative (or final) assessment is used it is to include the application of the competency in the normal work environment or, at a minimum, the application of the competency in a realistically simulated work environment. In some circumstances, assessment in part or full can occur outside the workplace. However, it must be in accordance with industry and regulatory policy.

Methods chosen for a particular assessment will be influenced by various factors. These include the extent of the assessment, the most effective locations for the assessment activities to take place, access to physical resources, additional safety measures that may be required and the critical nature of the competencies being assessed.

The critical safety issues inherent in working with electricity, electrical equipment, gas or any other hazardous substance/material present a challenge for those determining competence. Sources of evidence need to be ‘rich’ in nature to minimise error in judgment.

Activities associated with normal everyday work have a bearing on the decision as to how much and how detailed the data gathered will contribute to its ‘richness’. Some skills are more critical to safety and operational requirements while the same skills may be more or less frequently practised. These points are raised for the assessors to consider when choosing an assessment method and developing assessment instruments. Sample assessment instruments are included for Assessors in the Assessment Guidelines of this Training Package.

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Critical aspects of evidence required to demonstrate competency in this unit

9.2)

Before the critical aspects of evidence are considered all prerequisites must be met.

Evidence for competence in this unit must be considered holistically. Each element and associated performance criteria must be demonstrated on at least two occasions in accordance with the 'Assessment Guidelines – UEE11'. Evidence must also comprise:

- A representative body of work performance demonstrated within the timeframes typically expected of the discipline, work function and industrial environment. In particular this must incorporate evidence that shows a candidate is able to:
  - Implement Occupational Health and Safety workplace procedures and practices including the use of risk control measures as specified in the performance criteria and range statement
  - Apply sustainable energy principles and practices as specified in the performance criteria and range statement
  - Demonstrate an understanding of the essential knowledge and associated skills as described in this unit. It may be required by some jurisdictions that RTOs provide a percentile graded result for the purpose of regulatory or licensing requirements.
  - Demonstrate an appropriate level of skills enabling employment
  - Conduct work observing the relevant Anti Discrimination legislation, regulations, polices and workplace procedures
- Demonstrated consistent performance across a representative range of contexts from the prescribed items below:
  - Maintain and repair facilities associated with remote area essential service operations as described in 8) and including:

A	Understanding the location and nature of the work required
B	Identifying deterioration and damage to facilities correctly

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C	Carrying out maintenance and repairs effectively
D	Identifying maintenance issues beyond the scope of prescribed work and notifying appropriate persons
E	Documenting work activities accurately
F	Dealing with unplanned events by drawing on essential knowledge and skills to provide appropriate solutions incorporated in a holistic assessment with the above listed items Note: Successful completion of relevant vendor training may be used to contribute to evidence on which competency is deemed. In these cases the alignment of outcomes of vendor training with performance criteria and critical aspects of evidence must be clearly identified

Context of and specific resources for assessment

9.3)

This unit should be assessed as it relates to normal work practice using procedures, information and resources typical of a workplace. This should include:

- OHS policy and work procedures and instructions.
- Suitable work environment, facilities, equipment and materials to undertake actual work as prescribed by this unit.

These should be part of the formal learning/assessment environment.

Note:

Where simulation is considered a suitable strategy for assessment, conditions must be authentic and as far as possible reproduce and replicate the workplace and be consistent with the approved industry simulation policy.

The resources used for assessment should reflect current industry practices in relation to maintaining and repairing facilities associated with remote area essential service operations.

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Method of assessment **9.4)**

This unit shall be assessed by methods given in Volume 1, Part 3 'Assessment Guidelines'.

Note:

Competent performance with inherent safe working practices is expected in the Industry to which this unit applies. This requires assessment in a structured environment which is intended primarily for learning/assessment and incorporates all necessary equipment and facilities for learners to develop and demonstrate the essential knowledge and skills described in this unit.

Concurrent assessment and relationship with other units **9.5)**

There are no concurrent assessment recommendations for this unit.

The critical aspects of occupational health and safety covered in unit UEENEEE101A and other discipline specific occupational health and safety units shall be incorporated in relation to this unit.

Range Statement

RANGE STATEMENT

10) This relates to the unit as a whole providing the range of contexts and conditions to which the performance criteria apply. It allows for different work environments and situations that will affect performance.

This unit must be demonstrated in relation to maintaining and repairing facilities associated with at least two different remote area essential service operations

Generic terms used throughout this Vocational Standard shall be regarded as part of the Range Statement in which competency is demonstrated. The definition of these and other terms that apply are given in Volume 2, Part 2.1.

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Unit Sector(s)

Not applicable.

Competency Field

Competency Field **11)**

Renewable and Sustainable Energy

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UEENEEK118A Maintain and monitor remote area essential service (RAPS) operations

Modification History

Not applicable.

Unit Descriptor

Unit Descriptor **1) Scope:**

1.1) Descriptor

This unit covers basic maintenance power station compound of remote area infrastructure facilities, monitoring power station performance and developing a basic maintenance schedule. It encompasses working safely, to maintenance standards and following maintenance routines, identifying deterioration and damage to facilities using routine procedures, reading and recording performance information from instruments/meters and completing the necessary reporting.

Application of the Unit

Application of the Unit **2)**

This unit is intended primarily for indigenous persons seeking qualifications in remote area utilities facilities servicing. The unit may also be applied to work entry qualifications in renewable energy service work in general and be used in school-based vocational programs.

Licensing/Regulatory Information

License to practice **3)**

The skills and knowledge described in this unit do not require a license to practice in the workplace. However, practice in this unit is subject to regulations directly

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License to practice **3)**

related to occupational health and safety and contracts of training such as new apprenticeships.

Note:

1. Compliance with permits may be required in various jurisdictions and typically relates to the operation of plant, machinery and equipment such as elevating work platforms, powder operated fixing tools, power operated tools, vehicles, road signage and traffic control and lifting equipment. Permits may also be required for some work environments such as confined spaces, working aloft, near live electrical apparatus and site rehabilitation.

2. Compliance may be required in various jurisdictions relating to currency in First Aid, confined space, lifting, risk safety measures etc

Pre-Requisites

Prerequisite Unit(s) **4)**

Competencies **4.1)**

Granting competency in this unit shall be made only after competency in the following unit(s) has/have been confirmed.

UEENEEE101A	Apply Occupational Health Safety regulations, codes and practices in the workplace
UEENEEK102A	Work safely with remote area power supply systems

Literacy and numeracy skills **4.2)**

Participants are best equipped to achieve competency in this unit if they have reading, writing and numeracy skills indicated by the following scales. Description of each scale is given in Volume 2, Part 3 ‘Literacy and Numeracy’

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Reading 3 Writing 3 Numeracy 3

Employability Skills Information

Employability Skills **5)**

The required outcomes described in this unit of competency contain applicable facets of Employability Skills. The Employability Skills Summary of the qualification in which this unit of competency is packaged will assist in identifying Employability Skill requirements.

Elements and Performance Criteria Pre-Content

6) Elements describe the essential outcomes of a competency standard unit

Performance Criteria describe the required performance needed to demonstrate achievement of the element. Assessment of performance is to be consistent with the Evidence Guide.

Elements and Performance Criteria

ELEMENT	PERFORMANCE CRITERIA
1 Prepare to maintain and power station compound and monitor performance.	1.1 OHS procedures for a remote area power station facility is identified, obtained and understood through established routines and procedures
	1.2 Established OHS risk control measures and procedures in preparation for the work are followed
	1.3 Safety hazards which have not previously been identified are reported and advice on risk control measures is sought from the work supervisor
	1.4 The nature and location of remote area power station facility is obtained from documentation or from work supervisor to establish the scope of work to be undertaken

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ELEMENT	PERFORMANCE CRITERIA	
	1.5	Advice is sought from the work supervisor to ensure the work is coordinated effectively with fellow workers and the local community
	1.6	Sources of materials that may be required for the work are identified and accessed in accordance with established routines and procedures
	1.7	Tools, equipment and testing devices needed to carry out the work are obtained and checked for correct operation and safety.
	1.8	Established procedures are followed to repair or replace defective and unsafe tools and service equipment.
2 Maintain power station compound and monitor performance	2.1	Established OHS risk control measures and procedures for carrying out the work are followed
	2.2	Circuits/machines/plant are checked as being isolated where necessary in strict accordance OHS requirements and procedures
	2.2	Established procedures are followed to clean and tidy power station building, generating equipment and compound to maintain safe and efficient plant area.
	2.3	Inspection and reporting is conducted on suitability, location and legibility of safety signage.
	2.4	Inspection and reporting is conducted on location, suitability and condition of fighting equipment
	2.5	Performance, status and fuel and oil use of generation equipment is monitored and logged from information displayed instruments, meters and measuring devices.
	2.7	Procedures are followed for referring non-routine events to immediate supervisor for directions
	2.8	Routine quality checks are carried out in

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ELEMENT	PERFORMANCE CRITERIA	
		accordance with work instructions
3 Develop basic maintenance schedule and complete work report	3.1	OHS work completion risk control measures and procedures are followed.
	3.2	Maintenance schedule is developed from logged information on power station performance, status and condition of compound.
	3.3	Procedures are followed for referring maintenance issues beyond the scope of prescribed work to persons of higher authority.
	3.4	Work carried out is reported to the work supervisor through the established maintenance reporting procedures.

Required Skills and Knowledge

REQUIRED SKILLS AND KNOWLEDGE

8) This describes the essential skills and knowledge and their level, required for this unit.

Evidence must show that knowledge has been acquired of safe working practices and maintaining and repairing facilities associated with remote area essential service operations.

All knowledge and skills detailed in this unit should be contextualised to current industry practices and technologies.

KS01-EK118A Power station and compound maintenance

Evidence shall show an understanding of RAPS compound maintenance and meter reading to an extent indicated by the following aspects:

Maintaining clean, tidy and safe condition of the power station building and generating equipment encompassing:

- Removal of generating plant oil, coolant and fuel leaks.
- Removal fluid spills from plant room floor areas.
- Cleaning of power house ventilation systems
- Removal of insects and fauna from plant area.
- Environmentally safe disposal of used consumables and

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REQUIRED SKILLS AND KNOWLEDGE

rubbish.

- Repositioning empted rubbish bins.
- Correct storage of plant spares.

Maintaining a clean, tidy and safe working environment of power station compound encompassing:

- Repairing and securing compound perimeter fencing and gates.
- Removal and environmentally safe disposal of flora from the fence line and plant room perimeter.
- Removal and environmentally safe disposal compound rubbish
- Cutting and watering the compound grassed area.
- Safe arrangements for storage of fuel drums and other flammable liquids.
- Maintaining water reticulation equipment.

Inspecting, classifying and repairing the power station tools and equipment encompassing:

- Inspecting and reporting hand tools and service equipment for serviceability.
- Equipment repair procedures.
- Cleaning and storage of tools and equipment.

Inspecting and reporting on the safety signage displayed in the power station and on the perimeter fence encompassing:

- Types and location of safety signs relevant to a community power station and compound.
- Reporting on the conditions and suitability of the signs.

Locating, inspecting and reporting on the fixed and portable fire fighting equipment contained in and around the power station encompassing:

- Types of fire fighting equipment suitable for a power station.
- Typical locations of power station fire fighting equipment.
- Inspecting and reporting suitability and condition of fire fighting equipment.

Instruments/meters showing performance/status of community power stations encompassing:

- Types of information displayed on the instrument panel and switchboards (engine oil pressure, coolant temperatures fuel pressure/flow, amperes, voltage, kilowatt, kilowatt hours,

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REQUIRED SKILLS AND KNOWLEDGE

frequency Hertz, and engine running hours).

- Instrument/meter reading and recording techniques.
- Dip stick measurement measure and recording methods of bulk fuel and engine oil.

Developing maintenance schedules from logged information of community power station performance encompassing:

- Logged information is that listed in T1 above.
- Maintenance schedules includes timely ordering of fuel, coolant and engine oil, engine oil changes, engine oil filter changes, fan belt condition and adjustment, air cleaner element service, minor tune up requirements, valve adjustments and minor and major overhaul work.

Instrument/meter reading and maintenance scheduling records.

Evidence Guide

EVIDENCE GUIDE

9) This provides essential advice for assessment of the unit and must be read in conjunction with the performance criteria and the range statement of the unit and the Training Package Assessment Guidelines.

The Evidence Guide forms an integral part of this unit. It must be used in conjunction with all parts of this unit and performed in accordance with the Assessment Guidelines of this Training Package.

Overview of Assessment

9.1)

Longitudinal competency development approaches to assessment, such as Profiling, require data to be reliably gathered in a form that can be consistently interpreted over time. This approach is best utilised in Apprenticeship programs and reduces assessment intervention. It is the industry-preferred model for apprenticeships. However, where summative (or final) assessment is used it is to include the application of the competency in the normal work environment or, at a minimum, the application of the competency in a realistically simulated work environment. In some circumstances, assessment in part or full can occur outside the workplace. However, it must be in accordance with industry and

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regulatory policy.

Methods chosen for a particular assessment will be influenced by various factors. These include the extent of the assessment, the most effective locations for the assessment activities to take place, access to physical resources, additional safety measures that may be required and the critical nature of the competencies being assessed.

The critical safety issues inherent in working with electricity, electrical equipment, gas or any other hazardous substance/material present a challenge for those determining competence. Sources of evidence need to be 'rich' in nature to minimise error in judgment.

Activities associated with normal everyday work have a bearing on the decision as to how much and how detailed the data gathered will contribute to its 'richness'. Some skills are more critical to safety and operational requirements while the same skills may be more or less frequently practised. These points are raised for the assessors to consider when choosing an assessment method and developing assessment instruments. Sample assessment instruments are included for Assessors in the Assessment Guidelines of this Training Package.

Critical aspects of evidence required to demonstrate competency in this unit

9.2)

Before the critical aspects of evidence are considered all prerequisites must be met.

Evidence for competence in this unit must be considered holistically. Each element and associated performance criteria must be demonstrated on at least two occasions in accordance with the 'Assessment Guidelines – UEE11'. Evidence must also comprise:

- A representative body of work performance demonstrated within the timeframes typically expected of the discipline, work function and industrial environment. In particular this must incorporate evidence that shows a candidate is able to:
  - Implement Occupational Health and Safety workplace procedures and practices including the use of risk control measures as specified in the performance criteria and range statement

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- Apply sustainable energy principles and practices as specified in the performance criteria and range statement.
- Demonstrate an understanding of the essential knowledge and associated skills as described in this unit. It may be required by some jurisdictions that RTOs provide a percentile graded result for the purpose of regulatory or licensing requirements.
- Demonstrate an appropriate level of skills enabling employment
- Conduct work observing the relevant Anti Discrimination legislation, regulations, polices and workplace procedures

- Demonstrated consistent performance across a representative range of contexts from the prescribed items below:
  - Maintain and monitor remote area essential service operations as described in 8) and including:

A	Understanding the location and nature of the work required
B	Following established procedures for repairing or replacing defectives tools and service equipment
C	Cleaning and tidying power station building, generating equipment and compound effectively.
D	Correctly inspecting and reporting suitability, location and legibility of safety signage.
E	Correctly inspecting and reporting location, suitability and condition of fighting equipment.
F	Accurately monitoring and logging performance, status and fuel and oil use of generation equipment.
G	Developing an appropriate basic maintenance schedule from logged information
H	Documenting work activities accurately
I	Dealing with unplanned events by drawing on essential knowledge and skills to provide appropriate solutions incorporated in a holistic assessment with the above listed items Note: Successful completion of relevant vendor training may be used to contribute to evidence on which

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competency is deemed. In these cases the alignment of outcomes of vendor training with performance criteria and critical aspects of evidence must be clearly identified

Context of and specific resources for assessment **9.3)**

This unit should be assessed as it relates to normal work practice using procedures, information and resources typical of a workplace. This should include:

- OHS policy and work procedures and instructions.
- Suitable work environment, facilities, equipment and materials to undertake actual work as prescribed by this unit.

These should be part of the formal learning/assessment environment.

Note:

Where simulation is considered a suitable strategy for assessment, conditions must be authentic and as far as possible reproduce and replicate the workplace and be consistent with the approved industry simulation policy.

The resources used for assessment should reflect current industry practices in relation to maintaining and repairing facilities associated with remote area essential service operations.

Method of assessment **9.4)**

This unit shall be assessed by methods given in Volume 1, Part 3 ‘Assessment Guidelines’.

Note:

Competent performance with inherent safe working practices is expected in the Industry to which this unit applies. This requires assessment in a structured environment which is intended primarily for learning/assessment and incorporates all necessary equipment and facilities for learners to develop and demonstrate the essential knowledge and skills described in this unit.

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Concurrent assessment and relationship with other units **9.5)**

There are no concurrent assessment recommendations for this unit.

The critical aspects of occupational health and safety covered in unit UEENEEE101A and other discipline specific occupational health and safety units shall be incorporated in relation to this unit.

Range Statement

RANGE STATEMENT

10) This relates to the unit as a whole providing the range of contexts and conditions to which the performance criteria apply. It allows for different work environments and situations that will affect performance.

This unit must be demonstrated in relation to least two different remote area essential service operations.

Generic terms used throughout this Vocational Standard shall be regarded as part of the Range Statement in which competency is demonstrated. The definition of these and other terms that apply are given in Volume 2, Part 2.1.

Unit Sector(s)

Not applicable.

Competency Field

Competency Field **11)**

Renewable and Sustainable Energy

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UEENEEK123A Carry out basic repairs to renewable energy apparatus

Modification History

Not applicable.

Unit Descriptor

Unit Descriptor **1) Scope:**

1.1) Descriptor

This unit deals with the replacement of electrical and non-electrical components of renewable energy apparatus. It encompasses safe working practices, following written and oral instructions and procedures, basic testing techniques, disconnecting and reconnecting electrical/electronic components, dismantling and assembling apparatus and reporting repair activities.

Application of the Unit

Application of the Unit **2)**

This unit is intended for competency development entry-level employment-based programs incorporated in approved contracts of training.

Licensing/Regulatory Information

License to practice **3)**

The skills and knowledge described in this unit do not require a license to practice in the workplace provided equipment is not connected to installation wiring at voltage above 50 V a.c. or 120 V d.c. However, practice in this unit is subject to regulations directly related to occupational health and safety and where applicable contracts of training such as apprenticeships.

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License to practice **3)**

Note:

1. Compliance with permits may be required in various jurisdictions and typically relates to the operation of plant, machinery and equipment such as elevating work platforms, powder operated fixing tools, power operated tools, vehicles, road signage and traffic control and lifting equipment. Permits may also be required for some work environments such as confined spaces, working aloft, near live electrical apparatus and site rehabilitation.

2. Compliance may be required in various jurisdictions relating to currency in First Aid, confined space, lifting, risk safety measures etc.

Pre-Requisites

Prerequisite Unit(s) **4)**

Competencies **4.1)**

Granting competency in this unit shall be made only after competency in the following unit(s) has/have been confirmed.

UEENEEE104A	Solve problems in d.c. circuits

AND

UEENEEE108A	Lay wiring/cabling and terminate accessories for extra-low voltage (ELV) circuits

OR

UEENEEG106A	Terminate cables, cords and accessories for low voltage circuits

Literacy and numeracy skills **4.2)**

Participants are best equipped to achieve competency in this unit if they have reading, writing and numeracy skills

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indicated by the following scales. Description of each scale is given in Volume 2, Part 3 'Literacy and Numeracy'

Reading 3 Writing 3 Numeracy 3

Employability Skills Information

Employability Skills **5)**

The required outcomes described in this unit of competency contain applicable facets of Employability Skills. The Employability Skills Summary of the qualification in which this unit of competency is packaged will assist in identifying Employability Skill requirements.

Elements and Performance Criteria Pre-Content

6) Elements describe the essential outcomes of a competency standard unit

Performance Criteria describe the required performance needed to demonstrate achievement of the element. Assessment of performance is to be consistent with the Evidence Guide.

Elements and Performance Criteria

ELEMENT	PERFORMANCE CRITERIA
1 Prepare to repair renewable energy apparatus.	1.1 OHS procedures for a given work area are identified, obtained and understood through established routines and procedures
	1.2 Established OHS risk control measures and procedures in preparation for the work are followed
	1.3 The nature of the repair is obtained from documentation or from work supervisor to establish the scope of work to be undertaken
	1.4 Advice is sought from the work supervisor to ensure the work is coordinated effectively with

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ELEMENT	PERFORMANCE CRITERIA	
		others
	1.5	Sources of materials that may be required for the work are identified and accessed in accordance with established routines and procedures
	1.6	Tools, apparatus and testing devices needed to carry out the work are obtained and checked for correct operation and safety
2 Repair renewable energy apparatus.	2.1	Established OHS risk control measures and procedures for carrying out the work are followed
	2.2	The need to test or measure live is determined in strict accordance with OHS requirements and when necessary conducted within established safety procedures
	2.3	Circuits/apparatus are checked as being isolated where necessary in strict accordance OHS requirements and procedures
	2.4	Apparatus is dismantled in accordance with manufacturer's guide and supervisor's instructions
	2.5	Component parts are tagged during the dismantling to help ensure correct and efficient reassembly and stored to protect them against loss or damage
	2.6	Repairs are affected efficiently without damage to other components, apparatus or circuits.
	2.7	Apparatus is assembled in an appropriate sequence with all parts placed, secured and connected in accordance with manufacturer guide or industry practice
	2.8	Procedures are followed for referring non-routine events to immediate supervisor for directions
	2.9	Repairs are carried out efficiently without waste of materials or damage to apparatus and the surrounding environment or services and using

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ELEMENT	PERFORMANCE CRITERIA	
		sustainable energy practices
3 Complete and report repair work activities.	3.1	OHS work completion risk control measures and procedures are followed
	3.2	Repaired apparatus is prepared for testing by an appropriate person
	3.3	Work area is cleaned and made safe in accordance with established procedures
	3.4	Work supervisor is notified of the completion of the repair work in accordance with established procedures

Required Skills and Knowledge

REQUIRED SKILLS AND KNOWLEDGE

8) This describes the essential skills and knowledge and their level, required for this unit.

Evidence must show that knowledge has been acquired of safe working practices and carrying out basic repairs to renewable energy apparatus by replacement of components.

All knowledge and skills detailed in this unit should be contextualised to current industry practices and technologies.

KS01-EK123A Introduction to renewable energy technologies

Evidence shall show an understanding of renewable energy principles and technologies to the extent indicated by the following aspects:

T1 Major non-technical issues encompassing:

- impact of economic, social, environmental and political issues on the use of renewable energy technologies.
- how each of the non-technical issues impact on the application of a selected renewable energy technology.

T2 Energy services and demand encompassing:

- definition of the terms: energy, power, energy efficiency, end use energy, primary energy, embodied energy.
- calculation relating to energy, power and time with the

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REQUIRED SKILLS AND KNOWLEDGE

appropriate number and time with the appropriate number of significant figures.

- units and symbols for energy, power, time and temperature using standard SI units and prefixes.
- conversion of energy and power quantities from one unit to another using conversion tables
- the two laws that apply to any energy conversion process.
- efficiency of a simple energy conversion process.
- energy services required by a domestic dwelling.
- power and energy consumption of individual appliances and systems using appropriate meters or other methods.
- calculation of the end use and primary energy required for these energy services.
- selection of the most appropriate energy source for each of these services.
- justification in terms of environmental, economic, social and political constraints.
- selection of appropriate energy efficient appliances and technologies.

T3 The solar resource encompassing:

- definition of the terms: irradiation, latitude, solar constant, direct and diffuse radiation, azimuth and altitude angles, irradiance, solar window, tilt angle, solstice, equinox.
- units and symbol for irradiation and irradiance and the conversion of one unit to another using conversion tables.
- measurement of solar irradiance with a solarimeter.
- solar radiation data tables and contour maps.
- position of the sun for a given date, time and latitude using a sun path diagram.
- times when an obstacle will shade a given collector.
- how radiation varies throughout the year on the surface of a collector which is either fixed, single-axis tracking or double-axis tracking.
- appropriate tilt angles for fixed and seasonally-adjustable collectors at a given latitude and given application
- calculation of the effect of single-axis tracking and double-axis tracking on collected radiation using radiation data tables.

T4 Solar thermal systems encompassing:

- definition of the terms: conduction, convection, radiation, collector heat loss co-efficient, conductivity, specific hear,

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REQUIRED SKILLS AND KNOWLEDGE

solar fraction.

- components for a solar thermal system including collector, storage, reticulation and control.
- solar collector types suitable for low, medium and high temperature applications.
- different types of domestic solar hot water (SWH) systems.
- how the components of thermosiphon and pumped storage systems operate.
- heat loss mechanisms in collectors.
- stratification in storage tanks.
- backup energy systems.
- control and protection strategies.
- solar fraction of a domestic SHW system with the use of table or nomograms.

T5 Energy efficient building design encompassing:

- definition of the terms: thermal comfort, passive system, active system, aspect of the site, orientation of the building, thermal mass.
- the climate factors which affect building design.
- relationship between thermal comfort and climate.
- relationship between the seasonal variation of the sun's path and the heat gain of the building elements (roof, walls, windows, floor).
- effect of the thermal conductivity of building materials on heat flows to and from the building
- use of thermal mass in reducing temperature variations within the building.
- use of ventilation.
- thermal performance of a dwelling using both indoor and outdoor hourly temperature measurements over the period of at least one day.
- effect of insulation, glazing, orientation, shading devices, thermal mass and ventilation on the thermal performance of a building.
- an active solar system which could be used in a dwelling to complement passive design features in extreme climates.
- aspects of an existing dwelling that contribute to or detract from thermal performance.

T6 Photovoltaic arrays encompassing:

- definition of the terms: photovoltaic (PV) cell, module, series,

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REQUIRED SKILLS AND KNOWLEDGE

parallel, array, maximum power point (MPP), nominal operating cell temperature (NOCT), short circuit current (ISC), open Circuit voltage (VOC), I-V curve, current at maximum power point (IMP), voltage at maximum power point (VMP).

- calculations relating to voltage, current and power with the appropriate number of significant figures and using standard SI units and prefixes.
- types of commercially available PV modules, their efficiency and typical applications.
- I-V curve for a typical PV module and label the approximate position of MPP and values of ISC, VOC, IMP and VMP.
- effect of irradiance and temperature on ISC, VOC, IMP and VMP.
- function of blocking and bypass diodes.
- current and voltage of a single module to produce the I-V characteristic curve.
- major specification criteria for a PV module.
- size and configuration of a PV array for a given load and system voltage using tables or nomograms.

T7 Wind energy resources encompassing:

- definition of the terms: kinetic energy, specific wind power, vertical wind speed profile, surface roughness, temperature inversion layer, cut in (vC), rated (vR) and furling (vF) wind speeds, rated power (PR), power co-efficient (cP), output co-efficient (cO), tip speed ratio.
- units and symbols for wind speed, specific wind power and air density.
- large scale wind patterns over the Australian continent, their causes and the effect of local terrain on wind speed, direction and turbulence.
- specific wind power for given wind speeds.
- wind speed at different heights above ground level.
- the mean wind speed based on wind speed frequency distribution data in the form of a histogram.
- suitable minimum tower height for a Wind.
- energy conversion System (WECS) sited downwind from an obstacle.
- isovent maps.
- types of wind-measuring instruments and the minimum requirements for assessing wind energy at a given site.
- measurement of wind speed and direction

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REQUIRED SKILLS AND KNOWLEDGE

- characteristics of horizontal axis and vertical axis, upwind and downwind, lift and drag propelled wind turbines.
- power vs. wind speed curve for a typical WECS showing vC, vR, vF, and PR.
- major specification criteria for a WECS.
- sizing a WECS for a given load, efficiency and annual mean wind speed using tables or a nomogram.

T8 Micro-hydro system basis encompassing:

- definition of the terms: flow rate, gross or static head, potential energy, net or dynamic head, hydraulic efficiency, MHS efficiency, equivalent pipe length, reaction turbine, impulse turbine
- units and symbols for: flow rate, head, gravitational constant
- methods each assessing flow rate and head.
- measurement of stream flow rate and head.
- assessment from contour maps.
- different MHS in terms of their physical and operating characteristics.
- major specification criteria for an MHS for electricity generation.
- suitable type and size of MHS for a given load, efficiency, available flow rate and net head using tables or a nomogram.

T9 Energy storage encompassing:

- methods of energy storage.
- energy density of the energy storage methods above by mass and volume.
- define the following terms in relation to batteries: nominal voltage, cell, primary and secondary cells, battery, charge and discharge rate, amp hour capacity, watt hour capacity, state of charge (SOC), depth of discharge (DOD), specific gravity (SG), watt hour and amp hour efficiency, cycle life.
- major features of common types of batteries suitable for stand-alone power systems.
- state of charge of a lead-acid battery through measurement of specific gravity or battery voltage using safe working practices.

T10 Stand alone power system basis encompassing:

- d.c. sub-system efficiency.
- block diagram of a typical SPS
- function of each SPS system component

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- typical efficiencies of each component.
- major characteristics of different types of commercially available regulators, inverters and battery chargers.

T11 Biomass encompassing:

- definition of the terms: biogas, producer gas, biofuels, feedstock, gross and net calorific values.
- biofuels and their specific energy contents
- method of production of one of these five biofuels including: source of raw material/feedstock, conversion process, yield
- applications for each of the biofuels.
- assessment of the biomass resource required to meet a particular energy service e.g. cooking, hot water, space heat, transport, process heat, electricity.
- social, political and economic impact of large scale use of selected biomass resources.

Evidence Guide

EVIDENCE GUIDE

9) This provides essential advice for assessment of the unit and must be read in conjunction with the performance criteria and the range statement of the unit and the Training Package Assessment Guidelines.

The Evidence Guide forms an integral part of this unit. It must be used in conjunction with all parts of this unit and performed in accordance with the Assessment Guidelines of this Training Package.

Overview of Assessment **9.1)**

Longitudinal competency development approaches to assessment, such as Profiling, require data to be reliably gathered in a form that can be consistently interpreted over time. This approach is best utilised in Apprenticeship programs and reduces assessment intervention. It is the industry-preferred model for apprenticeships. However, where summative (or final) assessment is used it is to include the application of the competency in the normal work environment or, at a minimum, the application of the competency in a realistically simulated work environment. In some circumstances, assessment in part or full can occur outside the

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workplace. However, it must be in accordance with industry and regulatory policy.

Methods chosen for a particular assessment will be influenced by various factors. These include the extent of the assessment, the most effective locations for the assessment activities to take place, access to physical resources, additional safety measures that may be required and the critical nature of the competencies being assessed.

The critical safety issues inherent in working with electricity, electrical equipment, gas or any other hazardous substance/material present a challenge for those determining competence. Sources of evidence need to be 'rich' in nature to minimise error in judgment.

Activities associated with normal everyday work have a bearing on the decision as to how much and how detailed the data gathered will contribute to its 'richness'. Some skills are more critical to safety and operational requirements while the same skills may be more or less frequently practised. These points are raised for the assessors to consider when choosing an assessment method and developing assessment instruments. Sample assessment instruments are included for Assessors in the Assessment Guidelines of this Training Package.

Critical aspects of evidence required to demonstrate competency in this unit

9.2)

Before the critical aspects of evidence are considered all prerequisites must be met.

Evidence for competence in this unit must be considered holistically. Each element and associated performance criteria must be demonstrated on at least two occasions in accordance with the 'Assessment Guidelines – UEE11'. Evidence must also comprise:

- A representative body of work performance demonstrated within the timeframes typically expected of the discipline, work function and industrial environment. In particular this must incorporate evidence that shows a candidate is able to:
  - Implement Occupational Health and Safety workplace procedures and practices including the use of risk control measures as specified in the performance criteria and range

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statement

- Apply sustainable energy principles and practices as specified in the performance criteria and range statement
- Demonstrate an understanding of the essential knowledge and associated skills as described in this unit. It may be required by some jurisdictions that RTOs provide a percentile graded result for the purpose of regulatory or licensing requirements.
- Demonstrate an appropriate level of skills enabling employment
- Conduct work observing the relevant Anti Discrimination legislation, regulations, polices and workplace procedures

- Demonstrated consistent performance across a representative range of contexts from the prescribed items below:
  - Carry out basic repairs to renewable energy apparatus by replacement of components as described in 8) and including:

A	Following manufactures service instructions for access to components
B	Removing at least three different types of components specified in the work instructions
C	Replacing components to manufacturer requirements.
D	Reassembling the apparatus correctly.
E	Testing apparatus operation
F	Dealing with unplanned events by drawing on essential knowledge and skills to provide appropriate solutions incorporated in a holistic assessment with the above listed items

Note:

Successful completion of relevant vendor training may be used to contribute to evidence on which competency is deemed. In these cases the alignment of outcomes of vendor training with performance criteria and critical aspects of evidence must be clearly identified

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Context of and specific resources for assessment

9.3)

This unit should be assessed as it relates to normal work practice using procedures, information and resources typical of a workplace. This should include:

- OHS policy and work procedures and instructions.
- Suitable work environment, facilities, equipment and materials to undertake actual work as prescribed by this unit.

These should be part of the formal learning/assessment environment.

Note:

Where simulation is considered a suitable strategy for assessment, conditions must be authentic and as far as possible reproduce and replicate the workplace and be consistent with the approved industry simulation policy.

The resources used for assessment should reflect current industry practices in relation to carrying out basic repairs to renewable energy apparatus by replacement of components.

Method of assessment

9.4)

This unit shall be assessed by methods given in Volume 1, Part 3 ‘Assessment Guidelines’.

Note:

Competent performance with inherent safe working practices is expected in the Industry to which this unit applies. This requires assessment in a structured environment which is intended primarily for learning/assessment and incorporates all necessary equipment and facilities for learners to develop and demonstrate the essential knowledge and skills described in this unit.

Concurrent assessment and relationship with other units

9.5)

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For optimisation of training and assessment effort, competency development in this unit may be arranged concurrently with unit:

UEENEEE102A	Fabricate, assemble and dismantle utilities industry components
UEENEEE104A	Solve problems in d.c. circuits
UEENEEE107A	Use drawings, diagrams, schedules, standards, codes and specifications

The critical aspects of occupational health and safety covered in unit UEENEEE101A and other discipline specific occupational health and safety units shall be incorporated in relation to this unit.

Range Statement

RANGE STATEMENT

10) This relates to the unit as a whole providing the range of contexts and conditions to which the performance criteria apply. It allows for different work environments and situations that will affect performance.

This unit must be demonstrated in relation to carrying out basic repairs renewable energy apparatus limited to replacement or repair of components in which the fault has been previously established. This must include at least two different renewable energy apparatus in which three different types of components are faulty one of which is mechanical.

Generic terms used throughout this Vocational Standard shall be regarded as part of the Range Statement in which competency is demonstrated. The definition of these and other terms that apply are given in Volume 2, Part 2.1.

Unit Sector(s)

Not applicable.

Competency Field

Competency Field **11)**

Renewable and Sustainable Energy

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UEENEEK142A Apply environmentally and sustainable procedures in the energy sector

Modification History

Not applicable.

Unit Descriptor

Unit Descriptor **1) Scope:**

1.1) Descriptor

This competency standard unit requires the worker to undertake methods of work practice that minimises energy and material usage and to seek energy reduction strategies in the energy sector workplace. The unit seeks to minimise negative impacts on the environment.

Application of the Unit

Application of the Unit **2)**

This competency standards unit shall apply to persons entering work in energy sector and may be used in school based vocational programs.

Licensing/Regulatory Information

License to practice **3)**

The skills and knowledge described in this unit do not require a licence to practice in the work place. However practice in this unit is subject to regulations directly related to occupational health and safe and contracts of training such as new apprenticeships and the like.

Note:

1. Compliance with permits may be required in various jurisdictions and typically relates to the operation of plant, machinery and equipment such as elevating work

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License to practice **3)**

platforms, powder operated fixing tools, power operated tools, vehicles, road signage and traffic control, lifting equipment and the like. Permits may also be required for some work environments such as confined spaces, working aloft, near live electrical apparatus, site rehabilitation and the like.

2. Compliance may be required in various jurisdictions relating to currency in first aid, confined space, lifting, risk safety measure and the like

Pre-Requisites

Prerequisite Unit(s) **4)**

Competencies **4.1)**

There are no prerequisite competencies for this unit

Literacy and numeracy skills **4.2)**

Participants are best equipped to achieve this unit if they have reading, writing and maths skills indicated by the following scales. Description of each scale is given in Volume 2, Part 3 “Literacy and Numeracy”

Reading 3 Writing 3 Numeracy 3

Employability Skills Information

Employability Skills **5)**

The required outcomes described in this unit of competency contain applicable facets of Employability Skills. The Employability Skills Summary of the qualification in which this unit of competency is packaged will assist in identifying Employability Skill requirements.

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Elements and Performance Criteria Pre-Content

6) Elements describe the essential outcomes of a competency standard unit	Performance Criteria describe the required performance needed to demonstrate achievement of the element. Assessment of performance is to be consistent with the Evidence Guide.

Elements and Performance Criteria

ELEMENT		PERFORMANCE CRITERIA	
1	Plan and prepare to apply sustainable work practice	1.1	Activities are planned and prepared for to ensure OHS policies and procedures are followed with the work appropriately sequenced in accordance with requirements
		1.2	Appropriate personnel are consulted to ensure the work is co-ordinated effectively with others involved
		1.3	Materials are obtained and checked in accordance with established procedures and to comply with requirements
		1.4	Location in which activities are to be undertaken is determined from requirements
		1.5	Materials necessary to complete the work are obtained in accordance with established procedures and checked against job requirements
		1.6	Workplace environmental risks and resource efficiency issues are identified
2	Apply sustainable work practice	2.1	OHS policies and procedures for undertaking administrative functions are followed
		2.2	Activities are undertaken in accordance with requirements to implement techniques which produce energy reduction directly or indirectly
		2.3	Unplanned events or conditions are responded to in accordance with established procedures
		2.4	Approval is obtained in accordance with established procedures from appropriate personnel before any contingencies are

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ELEMENT	PERFORMANCE CRITERIA	
		implemented
	2.5	On-going checks of the quality of the work are undertaken in accordance with established procedures
	2.6	Work is carried out efficiently without unnecessary waste of materials or damage to the surrounding environment, while using sustainable work practices which minimise wastage of energy and materials either directly or indirectly
3 Complete the application of sustainable work practice	3.1	Documentation/reports are completed to ensure detailed promotional activities requirements are met
	3.2	Suggestions are made for improvements to workplace practices to minimise energy and materials wastage
	3.3	Completion is notified in accordance with established procedures

Required Skills and Knowledge

REQUIRED SKILLS AND KNOWLEDGE

8) This describes the essential skills and knowledge and their level, required for this unit.

Evidence shall show that knowledge has been acquired of safe working practices and applying environmentally and sustainable work practices in the energy sector.

All knowledge and skills detailed in this unit should be contextualised to current industry practices and technologies.

KS01-EK142A Environmentally and sustainable work practice

Evidence shall show an understanding of environmentally and sustainable work practices to an extent indicated by the following aspects:

T1 Sustainable work practices encompassing:

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REQUIRED SKILLS AND KNOWLEDGE

- Notion of sustainable work practice
- Effects of neglecting sustainable work practice
- The greenhouse effect - causes, consequences.
- International and national greenhouse imperatives.
- The role of regulators and similar bodies
- Legislative requirements
- Economic benefits of sustainable initiatives.

T2 Techniques for reducing carbon produced energy and hence greenhouse gases encompassing:

- domestic, commercial and industrial strategies
- trade related technologies and methods
- energy efficient retrofits (overview).
- renewable energy technologies (overview)

Evidence Guide

EVIDENCE GUIDE

9) This provides essential advice for assessment of the unit of competency and must be read in conjunction with the performance criteria and the range statement of the unit of competency and the Training Package Assessment Guidelines.

The Evidence Guide forms an integral part of this Competency Standard Unit and shall be used in conjunction with all components parts of this unit and, performed in accordance with the Assessment Guidelines of this Training Package.

Overview of Assessment **9.1)**

Longitude competency development approaches to assessment, such as Profiling, require data to be reliably gathered in a form that can be consistently interpreted over time. This approach is best utilised in Apprenticeship programs and reduces assessment intervention. It is the Industry's preferred model for apprenticeships. However, where summative (or final) assessment is used it is to include the application of the competency in the normal work environment or, at a minimum, the application of the competency in a realistically simulated work environment. It is recognised that, in some circumstances, assessment in part or full can occur outside the workplace. However, it must be in accord

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with Industry and, Regulatory policy in this regard.

Methods chosen for a particular assessment will be influenced by various factors. These include the extent of the assessment, the most effective locations for the assessment activities to take place, access to physical resources, additional safety measures that may be required and the critical nature of the competencies being assessed.

The critical safety nature of working with electricity, electrical equipment, gas or any other hazardous substance/material carries risk in deeming a person competent. Hence, sources of evidence need to be 'rich' in nature so as to minimise error in judgment.

Activities associated with normal every day work have a bearing on the decision as to how much and how detailed the data gathered will contribute to its 'richness'. Some skills are more critical to safety and operational requirements while the same skills may be more or less frequently practiced. These points are raised for the assessors to consider when choosing an assessment method and developing assessment instruments. Sample assessment instruments are included for Assessors in the Assessment Guidelines of this Training Package.

Critical aspects of evidence required to demonstrate competency in this unit

9.2)

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Before the critical aspects of evidence are considered all prerequisites shall be met.

The evidence on which competency in this unit is based shall be considered holistically for each element on at least two occasions comprising:

- A representative body of work performance demonstrated within the timeframes typically expected of the discipline, work function and industrial environment. In particular this shall incorporate evidence that shows a candidate is able to:
  - Implement Occupational Health and Safety workplace procedures and practices including the use of risk control measures as specified in the performance criteria and range; and
  - Apply sustainable work practice principles and practices as specified in the performance criteria and range; and
  - Demonstrate an understanding of the essential knowledge and associated skills as described in this unit. It may be required by some jurisdictions that RTOs provide a percentile graded result for the purpose of regulatory or licensing requirements. and
  - Demonstrate an appropriate level of skills enabling employment; and
  - Conduct work observing the relevant Anti Discrimination legislation, regulations, polices and workplace procedures; and
- Demonstrated performance across a representative range of contexts from the prescribed items below:
  - Participate in environmentally sustainable work practices as listed in the Range statement' and including:

A Apply sustainable work practice in daily work activities

B Dealing with unplanned events by drawing on essential knowledge and skills to provide appropriate solutions incorporated in the holistic assessment with the above listed items

Note:

Successful completion of relevant vendor training may be used to contribute to evidence on which competency is deemed. In these cases the alignment of outcomes of vendor training with performance criteria and critical aspects of evidence shall be clearly identified

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Context of and specific resources for assessment **9.3)**

This unit should be assessed as it relates to normal work practice using procedures, information and resources typical of a workplace. This should include:

- OHS policy and work procedures and instructions.
- Suitable work environment, facilities, equipment and materials to undertake actual work as prescribed by this competency standard unit.

Resources required to assess this unit are listed above in Context of assessment', which should also be used in the formal learning/assessment environment.

Note:

Where simulation is considered a suitable strategy for assessment it must ensure that the conditions for assessment are authentic and as far as possible reproduce and replicate the workplace and is consistent with the approved industry simulation policy.

In addition to the resources listed above in Context of and specific resources for assessment, evidence should show demonstrated competency in participating in environmentally sustainable work practices.

Method of assessment **9.4)**

This competency standard unit shall be assessed by methods given in Volume 1, Part 3 "Assessment Guidelines".

Note:

Competent performance with inherent safe working practices is expected in the Industry to which this competency standard unit applies. This requires that the specified essential knowledge and associated skills are assessed in a structured environment which is primarily intended for learning/assessment and incorporates all necessary equipment and facilities for learners to develop and demonstrate the essential knowledge and skills described in this unit.

Concurrent **9.5)**

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assessment and relationship with other units

There are no concurrent assessment recommendations for this unit.

Range Statement

RANGE STATEMENT

10) This relates to the unit of competency as a whole providing the range of contexts and conditions to which the performance criteria apply. It allows for different work environments and situations that will affect performance.

This competency standard unit shall be demonstrated in relation to participating in environmentally sustainable work practices in any of the following disciplines:

- Appliances
- Business equipment
- Computers
- Data Communications
- Electrical
- Electronics
- Fire protection
- Instrumentation and control
- Refrigeration and Air Conditioning
- Renewable / sustainable energy
- Security technology

Generic terms are used throughout this Vocational Standard shall be regarded as part of the Range of Variables in which competency is demonstrated. The definition of these and other terms that apply are given in Volume 2, Part 2.1.

Unit Sector(s)

Not applicable.

Competency Field

Competency Field **11)**

Renewable and Sustainable Energy

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UEENEEK145A Implement and monitor energy sector environmental and sustainable policies and procedures

Modification History

Not applicable.

Unit Descriptor

Unit Descriptor **1) Scope:**

1.1) Descriptor

This Competency Standard Unit specifies the outcomes for the collecting, interpretation and application of environmental management information, the identification of environmental impacts and the assessment of risks. It also consists of monitoring while implementing environmentally sustainable work polices and plans an, the development of modifications as part of the review process.

Application of the Unit

Application of the Unit **2)**

This Competency Standard Unit is intended to augment formally acquired competencies. It is suitable for employment-based programs under an approved contract of training. The unit addresses information processes and techniques for the implementation and monitoring of work place procedures that minimise energy use in the workplace.

Licensing/Regulatory Information

License to practice **3)**

The skills and knowledge described in this unit may require a licence/registration to practice in the work place subject to regulations for undertaking of electrical work.

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License to practice **3)**

Practice in workplace and during training is also subject to regulations directly related to Occupational Health and Safety, electricity/telecommunications/gas/water industry safety and compliance, industrial relations, environmental protection, anti discrimination and training. Commonwealth, State/Territory or Local Government legislation and regulations may exist that limits the age of operating certain equipment.

Pre-Requisites

Prerequisite Unit(s) **4)**

Competencies **4.1)**

There are no pre-requisites for this unit

Literacy and numeracy skills **4.2)**

Participants are best equipped to achieve this unit if they have reading, writing and maths skills indicated by the following scales. Description of each scale is given in Volume 2, Part 3 “Literacy and Numeracy”

Reading 4 Writing 4 Numeracy 4

Employability Skills Information

Employability Skills **5)**

The required outcomes described in this unit of competency contain applicable facets of Employability Skills. The Employability Skills Summary of the qualification in which this unit of competency is packaged will assist in identifying Employability Skill requirements.

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Elements and Performance Criteria Pre-Content

6) Elements describe the essential outcomes of a competency standard unit	Performance Criteria describe the required performance needed to demonstrate achievement of the element. Assessment of performance is to be consistent with the Evidence Guide.

Elements and Performance Criteria

ELEMENT	PERFORMANCE CRITERIA	
1 Prepare/plan to implement and monitor environmentally sustainable work practice management policies and procedures	1.1	Works schedule(s), including drawings, plans, requirements, established procedures, and material lists, are obtained, analysed, if necessary, by site inspection and the extent of the preparation of the work determined for planning and coordination.
	1.2	Work is prioritised and sequenced for the most efficient and effective outcome following consultation with others for completion within acceptable timeframes, to a quality standard and in accordance with established procedures.
	1.3	Relevant requirements (including environmental regulations) and established procedures for the work are given to all personnel and identified for all work sites.
	1.4	Hazards are identified, OHS risks assessed and control measures are prioritised, implemented and monitored to ensure safe systems of work are followed and according to established procedures.
	1.5	Resources including personnel, equipment, tools and personal protective equipment required for the job are identified, scheduled and coordinated and confirmed in a safe and technical working order.
	1.7	Risk management is applied to the job identifying and itemising ways in which energy wastage can be minimised
	1.8	Items for installation are sourced, where

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ELEMENT	PERFORMANCE CRITERIA	
		possible, that are recycled or reusable, in consultation with an agreement of the customer.
2 Carry out the implementation and monitoring of environmentally sustainable work management policies and procedures	2.1	Environmentally sustainable work practice to reduce/ minimise waste and excessive energy use are implemented and monitored in accordance with requirements and/or established procedures with input being sought from specialists where possible
	2.2	Implementation and monitoring of environmentally sustainable energy management policies and procedures are carried out, in accordance with the work schedule and requirements and/or established procedures.
	2.3	Essential Knowledge and Associated Skills in the safe implementation and monitoring of environmental and sustainable energy management policies and procedures are applied to ensure completion in an agreed timeframe and, to quality standards with a minimum of waste according to requirements.
	2.4	Solutions to non-routine problems are identified and actioned using acquired Essential Knowledge and Associated Skills according to requirements.
	2.5	Ongoing checks of quality of the work are undertaken in accordance with requirements and established procedures to ensure a quality like outcome is achieved for the client/customer and to a community/industry standard.
3 Complete the implementation and monitoring of environmental and sustainable energy management policies and procedures	3.1	Work undertaken is checked against works schedule for conformance with requirements, anomalies reported and solutions identified in accordance with established procedures.
	3.2	Work site is rehabilitated, cleaned up and confirmed safe in accordance with established procedures.
	3.3	Tools, equipment and any surplus resources and materials are, where appropriate, cleaned, checked and returned to storage in accordance

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ELEMENT	PERFORMANCE CRITERIA	
		with established procedures.
	3.4	Materials suitable for recycling and or reuse are identified and are stored for further use or proper disposal.
	3.5	Policies for implementing and monitoring of sustainable work practices are reviewed and updated from the experience of the current job and new procedures implemented if required.
	3.6	Relevant work permit(s) are signed off and the work completed/returned to service and advised to client/customer in accordance with requirements.
	3.7	New targets for energy minimisation are set, in keeping with successful strategies
	3.8	Successful strategies are promoted and where possible participants rewarded

Required Skills and Knowledge

REQUIRED SKILLS AND KNOWLEDGE

8) This describes the essential skills and knowledge and their level, required for this unit.

Evidence shall show that knowledge has been acquired implementing & monitoring, policies & procedures for environmentally sustainable electrotech work practice.

All knowledge and skills detailed in this unit should be contextualised to current industry practices and technologies.

KS01-EK145A Environmental and sustainable work practice - supervisory responsibilities

Evidence shall show an understanding of environmentally sustainable work practice, supervisory responsibilities to an extent indicated by the following aspects:

T1 Environmentally sustainable work practice principles encompassing:

- Provisions of relevant environmental legislation

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REQUIRED SKILLS AND KNOWLEDGE

- Notion of sustainable work practice
- Effects of neglecting sustainable work practice
- The greenhouse effect - causes, consequences.
- International and national greenhouse imperatives.
- The role of regulators and similar bodies
- Economic benefits of sustainable initiatives.
- Techniques for reducing the use of carbon based energy sources and hence greenhouse gas emissions
- domestic, commercial and industrial strategies
- trade related technologies and methods
- renewable energy technologies
- energy efficient retrofits

T2 Implementing and monitoring encompassing:

- Principles and practice of effective sustainable work practice management
- Workplace sustainable work practice non compliance, range and selection of control measures
- Organisational systems and policies and procedures needed for legislative compliance
- Impact of characteristics and composition of the workforce on sustainable work practice management
- Relevance of sustainable work practice management to other organisational management policies, procedures and systems.
- Analysis of entire work environment and judge sustainable work practice interventions
- Analysis of relevant workplace data
- Ability to assess resources needed for risk control.

Evidence Guide

EVIDENCE GUIDE

9) This provides essential advice for assessment of the unit of competency and must be read in conjunction with the performance criteria and the range statement of the unit of competency and the Training Package Assessment Guidelines.

The Evidence Guide forms an integral part of this Competency Standard Unit and shall be used in conjunction with all components parts of this unit and, performed in accordance with the Assessment Guidelines of this Training Package.

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Overview of Assessment **9.1)**

Longitude competency development approaches to assessment, such as Profiling, require data to be reliably gathered in a form that can be consistently interpreted over time. This approach is best utilised in Apprenticeship programs and reduces assessment intervention. It is the Industry's preferred model for apprenticeships. However, where summative (or final) assessment is used it is to include the application of the competency in the normal work environment or, at a minimum, the application of the competency in a realistically simulated work environment. It is recognised that, in some circumstances, assessment in part or full can occur outside the workplace. However, it must be in accord with Industry and, Regulatory policy in this regard.

Methods chosen for a particular assessment will be influenced by various factors. These include the extent of the assessment, the most effective locations for the assessment activities to take place, access to physical resources, additional safety measures that may be required and the critical nature of the competencies being assessed.

The critical safety nature of working with electricity, electrical equipment, gas or any other hazardous substance/material carries risk in deeming a person competent. Hence, sources of evidence need to be 'rich' in nature so as to minimise error in judgment.

Activities associated with normal every day work have a bearing on the decision as to how much and how detailed the data gathered will contribute to its 'richness'. Some skills are more critical to safety and operational requirements while the same skills may be more or less frequently practiced. These points are raised for the assessors to consider when choosing an assessment method and developing assessment instruments. Sample assessment instruments are included for Assessors in the Assessment Guidelines of this Training Package.

Critical aspects of evidence required to demonstrate competency in this unit **9.2)**

Before the critical aspects of evidence are considered all

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prerequisites shall be met.

The evidence on which competency in this unit is based shall be considered holistically for each element on at least two occasions comprising:

- A representative body of work performance demonstrated within the timeframes typically expected of the discipline, work function and industrial environment. In particular this shall incorporate evidence that shows a candidate is able to:
  - Implement Occupational Health and Safety workplace procedures and practices including the use of risk control measures as specified in the performance criteria and range; and
  - Apply sustainable energy principles and practices as specified in the performance criteria and range; and
  - Demonstrate an understanding of the essential knowledge and associated skills as described in this unit. It may be required by some jurisdictions that RTOs provide a percentile graded result for the purpose of regulatory or licensing requirements. and
  - Demonstrate an appropriate level of skills enabling employment; and
  - Conduct work observing the relevant Anti Discrimination legislation, regulations, polices and workplace procedures; and
  - Implement and monitor, policies and procedures for environmentally and sustainable electrotech work practice as listed in the Range statement' and including

A	Providing environmentally sustainable work practice information to the work group
B	Implementing and monitoring participative arrangements for the management of environmentally sustainable work practice
C	Implementing and monitoring the procedures for identifying procedures for identifying hazards, assessing risks and controlling risks
D	Implementing the procedures for dealing with hazardous events
E	Implementing and monitoring the procedures for environmentally sustainable work practice
F	Implementing and monitoring the procedures for maintaining environmentally sustainable work

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		practice records
	G	Dealing with unplanned events by drawing on essential knowledge and skills to provide appropriate solutions incorporated in the holistic assessment with the above listed items

Context of and specific resources for assessment **9.3)**

This unit should be assessed as it relates to normal work practice using procedures, information and resources typical of a workplace. This should include:

- OHS policy and work procedures and instructions.
- Suitable work environment, facilities, equipment and materials to undertake actual implementation and monitoring of environmental and sustainable energy management policies and procedures.

The resources used for assessment should reflect current industry practices in relation to implementing and monitoring, policies and procedures for environmentally and sustainable electrotech work practice.

Method of assessment **9.4)**

This Competency Standard Unit shall be assessed by methods given in Volume 1, Part 3 “Assessment Guidelines”.

Note:

Competent performance with inherent safe working practices is expected in the Industry to which this Competency Standard Unit applies. This requires that the specified Essential Knowledge and Associated Skills are assessed in a structured environment which is primarily intended for learning/assessment and incorporates all necessary equipment and facilities for learners to develop and demonstrate the essential knowledge and skills described in this unit.

Concurrent **9.5)**

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assessment and relationship with other units

For optimisation of training and assessment effort, competency development in this unit may be arranged concurrently with units:

UEENEEE117A	Implement and monitor energy sector OHS policies and procedures

Range Statement

RANGE STATEMENT

10) This relates to the unit of competency as a whole providing the range of contexts and conditions to which the performance criteria apply. It allows for different work environments and situations that will affect performance.

This Competency Standard Unit shall/may be demonstrated in relation to implementing and monitoring, policies and procedures for environmentally and sustainable electrotech work practice and may include the following equipment:

The following constants and variables included in the elements and performance criteria in this unit augment other definitions described in the Definitions section of this Training Package and form an integral part of the Range Statement of this unit:

- Environmental legislation may include relevant federal legislation; relevant state/territory legislation; relevant local government by-laws; relevant government or quasi government policies and regulations; relevant community planning and development agreements (e.g. Land care agreements)
- Environmental management documentation may include information on applicable environmental laws or other requirements; complaint records; training records; process information; process operational log books; inspection, maintenance and calibration records; relevant contractor and supplier information; incident reports; information on emergency preparedness and response.

Generic terms used throughout this Vocational Standard shall be regarded as part of the Range Statement in which competency is demonstrated. The definition of these and other terms that apply are given in Volume 2, Part 2.1.

Unit Sector(s)

Not applicable.

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Competency Field

Competency Field **11)**

Renewable and Sustainable Energy

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UEENEEP024A Attach cords and plugs to electrical equipment for connection to a single phase 230 Volt supply

Modification History

Not Applicable

Unit Descriptor

Unit Descriptor **1**)

1.1) Descriptor

This unit covers attaching flexible cords and plugs to electrical equipment for connection to supplies up to 230V a.c. This may be incidental to or a primary and regular function of work related to a principle function in the workplace. It encompasses working safely, identifying plug configurations, selecting and using testing and measuring devices, terminating and connecting cords/plugs and conductors, safety testing and reporting.

Application of the Unit

Application of the Unit **4**)

This unit applies to any formal recognition for this standard at the aligned AQF 2 level or higher.

Licensing/Regulatory Information

1.2) License to practice

The skills and knowledge described in this unit may require a license to practice in the workplace. However, practice in this unit is subject to regulations directly related to occupational health and safety and where applicable contracts of training such as apprenticeships.

Note:
Candidates are to meet regulator eligibility requirements by providing formal

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1.2) License to practice

confirmation from the relevant state/territory regulator for the respective work class and scope of work prior to developing and being conferred competent.

Pre-Requisites

Prerequisite Unit(s) **2)**

2.1) Competencies

Granting competency in this unit shall be made only after competency in the following unit(s) has/have been confirmed.

UEENEEE101A	Apply Occupational Health and Safety regulations, codes and practices in the workplace

Employability Skills Information

Employability Skills **3)**

This unit contains Employability Skills

The required outcomes described in this unit of competency contain applicable facets of Employability Skills. The Employability Skills Summary of the qualification in which this unit of competency is packaged will assist in identifying Employability Skill requirements.

Elements and Performance Criteria Pre-Content

6) Elements describe the essential outcomes of a unit of competency

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Elements and Performance Criteria

ELEMENT	PERFORMANCE CRITERIA	
1	Plan and prepare to attach flexible cord(s) and plug(s).	1.1 Work is planned and prepared to ensure OHS policies and procedures are followed, and the work is appropriately sequenced in accordance with requirements.
		1.2 Condition and ratings under which the flexible cords and plugs are to operate is determined from requirements and in consultation with appropriate personnel followed by written instruction.
		1.3 Flexible cords and plugs are selected to comply with standards and requirements for the condition and rating to be determined.
		1.4 Materials necessary to complete the work are obtained in accordance with established procedures and checked against job requirements.
		1.5 Tools, equipment and testing devices needed to carry out the work are obtained in accordance with established procedures and checked for correct operation and safety.
		1.6 Flexible cord(s) is prepared without damage to insulation and conductors and in accordance with requirements.
2	Attach flexible cord(s) and plug(s).	2.1 OHS policies and procedures are followed.
		2.2 Single insulated metal framed equipment is earthed in accordance with requirements.
		2.3 The integrity of double insulated equipment is maintained in accordance with requirements.
		2.4 Conductors are connected to terminals in accordance with requirements to ensure the required polarity is affected.

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3	Test equipment for operation and safety.	3.1 Appropriate tests of the cord(s) and plug(s) connected to the electrical equipment are conducted in accordance with requirements and to established procedures to ensure safe installation and operation.
		3.2 Ongoing checks of the quality of work are undertaken in accordance with established procedures.
4	Locate and repair fault(s) in attached flexible cord(s) and plug(s).	4.1 Electrical equipment and attached flexible cord(s) and plug(s) are isolated, where necessary, in accordance with established procedures.
		4.2 Other OHS policies and procedures are followed.
		4.3 Visual checks of the attached flexible cord(s) and plug(s) are carried out in accordance with established procedures to detect any abnormal or obvious damage or fault.
		4.4 Fault(s) in attached flexible cord(s) and plug(s) are confirmed and components to be replaced are determined and details recorded in accordance with established procedures.
		4.5 Fault(s) in attached flexible cord(s) and plug(s) are repaired in accordance with established procedures, where necessary.
		4.6 Approval is obtained in accordance with established procedures from appropriate personnel, before any contingencies are implemented.
5	Provide status report(s).	5.1 Status report(s) are completed and notified in accordance with established procedures.

Required Skills and Knowledge

REQUIRED SKILLS AND KNOWLEDGE

7) This describes the essential skills and knowledge and their level,

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required for this unit.

Evidence shall show that knowledge has been acquired of safe working practices and attaching cords and plugs to electrical equipment for connection to a single phase 230 Volt supply.

All knowledge and skills detailed in this unit should be contextualised to current industry practices and technologies.

KS01-EP024A **Flexible cords and plugs to 230 V**

Evidence shall show an understanding of flexible cords and plugs to 230 V to an extent indicated by the following aspects

T1 Safety encompassing:

* OH&S and electrical safety requirements

* requirements of AS/NZS 4836:2001 Safe working practices on low voltage installations

T2 The basic electrical circuit encompassing:

* simple electric circuit (supply, control device and load)

* symbol, units of measurement and the abbreviation for electromotive force, potential difference, current and resistance.

* drawing of a basic electrical circuit using correct symbols

* using multiples and submultiples for voltage, current and resistance values

* a.c and d.c supplies

* single phase electrical loads

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	* electrical circuit protection devices
T3 Relationships in an electrical circuit encompassing:	
	* relationship between voltage, current and resistance (Ohm's law)
	* changes in circuit parameters for altered values of voltage, current and resistance
	* electrical power in relationship to d.c. or resistive a.c. circuits
T4 Test Equipment - resistance measurement encompassing:	
	* types of electrical test equipment used for resistance measurement (analogue and digital multimeters, insulation resistance testers and continuity testers)
	* selection of appropriate electrical test instrument for continuity and insulation resistance measurement
	* using analogue and digital multimeters for resistance measurement (ensuring zero setting, correct scale selection, avoidance of parallax error and estimation of between division readings for analogue multimeters)
	* continuity tests and using a continuity tester to check the polarity of a three core extension cord
	* insulation resistance tests and minimum values for insulation resistance for low voltage equipment
	* reasons for insulation resistance testing is conducted at higher than supply voltage (AS/NZS3000 requirements)
	* using insulation resistance hand held tester
	* care and storage of electrical instruments
	* regulatory requirements in regard to the maintenance and testing of test instrumentation for resistance measurement.
T5 Selection of flexible cords and plugs to suit given applications	

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encompassing:

* types , structures and applications of common cores (parallel two core unsheathed (‘figure 8’) cords, light duty sheathed, ordinary duty sheathed, heavy duty sheathed and textile braided)

* determining the current rating of a range of commonly used flexible cords

* service duty

* purpose of colour coding and the recommended single phase colour code and the conventional code used in the most common alternative colours

* selection of appropriate flexible cords for a range of single phase appliances in regard to application, load, and service duty

* identification of correct plug and socket polarities for the range of commonly used 230 volt plug socket combinations

* factors affecting the choice of plugs and sockets including IP rating

* selection of the correct plug and socket combinations for a range of applications including use in damp areas

T6 Connecting flexible cords and plugs to appliances encompassing:

* design features of plugs and sockets which protect the conductor terminations from undue force when disconnecting a cord - tortuous path

* cord preparation - not to mark/damage the inner core when stripping the sheath for termination, double the end of the conductor to be terminated

* purpose of earthing

* structure of double insulated appliances, symbol, reasons they should not be earthed, and maintenance of the integrity of the double insulation

* preparation of the surfaces at an earthing connection before and after completion of the termination including terminations exposed to corrosion, and those

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for which no specific earthing terminal is provided

* fitting a range of various plugs and sockets with attention to requirements, colour code, polarity, and correct termination of conductors with the sheath well into the body, and the cord grip anchored

* terminate cords to several appliances utilising the appropriate cord type and rating

T7 Testing encompassing:

* importance of conducting both visual and electrical tests to ensure leads are safe and appropriate for connection to supply in regard to physical condition, sufficiently high insulation resistance, continuity, arrangements for protection against indirect contact are undamaged and in place, appropriate IP rating, and arrangements for protection against dangers of mechanical movement as relevant are undamaged and in place

* check polarity of plug, and for any abnormal or obvious damage or fault

* minimum acceptable value of insulation resistance between active neutral and earth

* conduct insulation resistance and continuity tests prior to, and after, connecting cords and plugs to appliances

* fault finding attached cords and plugs, and cord extension leads

T8 Producing documentation and reports encompassing:

* nature and content of, and the need to produce, status reports and documents

* Producing status reports and documents

Evidence Guide

EVIDENCE GUIDE

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EVIDENCE GUIDE

9) The evidence guide provides advice on assessment and must be read in conjunction with the Performance Criteria, Required Skills and Knowledge, the Range Statement and the Assessment Guidelines for this Training Package.

The Evidence Guide forms an integral part of this Unit and shall be used in conjunction with all components parts of this unit and performed in accordance with the Assessment Guidelines of this Training Package.

Overview of Assessment

9.**1**)

Longitudinal competency development approaches to assessment, such as Profiling, require data to be reliably gathered in a form that can be consistently interpreted over time. This approach is best utilised in Apprenticeship programs and reduces assessment intervention. It is the industry-preferred model for apprenticeships. However, where summative (or final) assessment is used it is to include the application of the competency in the normal work environment or, at a minimum, the application of the competency in a realistically simulated work environment. In some circumstances, assessment in part or full can occur outside the workplace. However, it must be in accordance with industry and regulatory policy.

Methods chosen for a particular assessment will be influenced by various factors. These include the extent of the assessment, the most effective locations for the assessment activities to take place, access to physical resources, additional safety measures that may be required and the critical nature of the competencies being assessed.

The critical safety issues inherent in working with electricity, electrical equipment, gas or any other hazardous substance/material present a challenge for those determining competence. Sources of evidence need to be 'rich' in nature to minimise error in judgment.

Activities associated with normal everyday work influence decisions about how/how much the data gathered will contribute to its 'richness'. Some skills are more critical to safety and operational requirements while the same skills may be more or less frequently practised. These points are raised for the assessors to consider when choosing an assessment method and developing assessment instruments. Sample assessment instruments are included for Assessors in the Assessment Guidelines of this Training Package.

Critical aspects of evidence required

9.**2**)

Before the critical aspects of evidence are considered all

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EVIDENCE GUIDE

to demonstrate competency in this unit

prerequisites shall be met.

Evidence for competence in this unit shall be considered holistically. Each element and associated performance criteria shall be demonstrated on at least two occasions in accordance with the 'Assessment Guidelines - UEE07'. Evidence shall also comprise:

- A representative body of work performance demonstrated within the timeframes typically expected of the discipline, work function and industrial environment. In particular this shall incorporate evidence that shows a candidate is able to:
  - Implement Occupational Health and Safety workplace procedures and practices including the use of risk control measures as specified in the performance criteria and range statement
  - Apply sustainable energy principles and practices as specified in the performance criteria and range statement
  - Demonstrate an understanding of the essential knowledge and associated skills as described in this unit. It may be required by some jurisdictions that RTOs provide a percentile graded result for the purpose of regulatory or licensing requirements.
  - Demonstrate an appropriate level of skills enabling employment
  - Conduct work observing the relevant Anti Discrimination legislation, regulations, polices and workplace procedures
- Demonstrated consistent performance across a representative range of contexts from the prescribed items below:
  - Attach cords and plugs to electrical equipment for connection to a single phase 230 Volt supply as described in 8) and including:

A Demonstrating consistent performance for each element of the unit

B Meeting the performance criteria associated with each element of competence by employing the techniques, procedures, information and resources available in the workplace

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EVIDENCE GUIDE

C	Demonstrating an understanding of the underpinning knowledge and skills shown in the Essential Knowledge and Associated Skills section of the unit
D	Planning and preparing to attach flexible cord(s) and plug(s) up to 230 V a.c
E	Attaching, replacing and repairing flexible cord(s) and plugs(s) to equipment, safely up to 230 V a.c
F	Testing flexible cord(s), plugs(s) and connected equipment for operation and safety up to 230 V a.c., including polarity and continuity testing
G	Finding and repairing fault(s) in attached flexible cord(s) and plug(s) in accordance with established procedures
H	Providing status report(s)
I	Dealing with unplanned events by drawing on essential knowledge and skills to provide appropriate solutions incorporated in a holistic assessment with the above listed items

Note:
Successful completion of relevant vendor training may be used to contribute to evidence on which competency is deemed. In these cases the alignment of outcomes of vendor training with performance criteria and critical aspects of evidence shall be clearly identified

Context of and specific resources for assessment

9.3)

This unit should be assessed as it relates to normal work practice using procedures, information and resources typical of a workplace. This should include:

- OHS policy and work procedures and instructions.
- Suitable work environment, facilities, equipment and materials to undertake actual work as prescribed by this unit.
- Workplace evidence to be produced in an industry/regulator approved recording system (logbook) confirming skills development under appropriate supervision

These should be part of the formal learning/assessment environment.

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EVIDENCE GUIDE

Note:

Where simulation is considered a suitable strategy for assessment, conditions must be authentic and as far as possible reproduce and replicate the workplace and be consistent with the approved industry simulation policy.

The resources used for assessment should reflect current industry practices in relation to attaching cords and plugs to electrical equipment for connection to a single phase 230 Volt supply.

Method of assessment

9.4)

This unit shall be assessed by methods given in Volume 1, Part 3 'Assessment Guidelines'.

Note:
Competent performance with inherent safe working practices is expected in the Industry to which this unit applies. This requires assessment in a structured environment which is intended primarily for learning/assessment and incorporates all necessary equipment and facilities for learners to develop and demonstrate the essential knowledge and skills described in this unit.

Concurrent assessment and relationship with other units

9.5)

There are no concurrent assessment recommendations for this unit

Range Statement

RANGE STATEMENT

8) This relates to the unit as a whole providing the range of contexts and conditions to which the performance criteria apply. It allows for different work environments and situations that will affect performance.

This unit shall be demonstrated in relation to any cord, cable and plug connected equipment or cord extension leads intended for single-phase supplies up to 230 V.

Note:

Limitations of this unit. This unit does not cover the knowledge and skills necessary for work:

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RANGE STATEMENT

a) Competencies associated with high current faults

b) On complex electrical apparatus, circuits and electrical work

c) In hazardous areas or on electrical equipment that is part of an explosion protection technique

d) Nor competencies associated with fixed wiring.

Safe Working. Safe procedures for working within in the scope of this unit shall be in accordance with AS/NZS 4836:2001 'Safe working on low-voltage electrical installations.'

Generic terms used throughout this Vocational Standard shall be regarded as part of the Range Statement in which competency is demonstrated. The definition of these and other terms that apply are given in Volume 2, Part 2.1.

Unit Sector(s)

Not Applicable

Custom Content Section

2.2) Literacy and numeracy skills

Participants are best equipped to achieve this unit if they have reading, writing and numeracy skills indicated by the following scales. Description of each scale is given in Volume 2, Part 3 'Literacy and Numeracy'

Reading	3	Writing	3	Numeracy	3

Competency Field

Competency Field **5)**

Restricted and Specialisations

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UEENEEP026A Conduct in-service safety testing of electrical cord connected equipment and cord assemblies

Modification History

Release	Action	Core/Elective	Details	Points
2	Edit		Add "Granting competency in this unit shall be made only after competency in the following unit(s) has/have been confirmed" in **Competencies 4.1)**	

Unit Descriptor

Unit Descriptor **1) Scope:**

1.1) Descriptor

This unit covers safety testing of electrical cord connected equipment and cord assemblies. It encompasses working safely, using portable apparatus tester, identifying faults, applying tagging, arranging for repair of faulty equipment and complete testing documentation.

Application of the Unit

Application of the Unit **2)**

This unit is intended to augment previously acquired competencies. It is suitable for employment-based programs under an approved contract of training.

Licensing/Regulatory Information

License to practice **3)**

The skills and knowledge described in this unit may require a license to practice in the workplace. However, practice in this unit is subject to regulations directly

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License to practice **3)**

related to occupational health and safety, general electrical safety and where applicable contracts of training such as apprenticeships.

Note:

1. Compliance with permits may be required in various jurisdictions and typically relates to the operation of plant, machinery and equipment such as elevating work platforms, powder operated fixing tools, power operated tools, vehicles, road signage and traffic control and lifting equipment. Permits may also be required for some work environments such as confined spaces, working aloft, near live electrical apparatus and site rehabilitation.

2. Compliance may be required in various jurisdictions relating to currency in First Aid, confined space, lifting and risk safety measures.

Pre-Requisites

Prerequisite Unit(s) **4)**

Competencies **4.1)**

Granting competency in this unit shall be made only after competency in the following unit(s) has/have been confirmed.

UEENEEE101A	Apply Occupational Health and Safety regulations, codes and practices in the workplace

Literacy and numeracy skills **4.2)**

Participants are best equipped to achieve this unit if they have reading, writing and numeracy skills indicated by the following scales. Description of each scale is given in Volume 2, Part 3 ‘Literacy and Numeracy’

Reading 3 Writing 3 Numeracy 3

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Employability Skills Information

Employability Skills **5)**

This unit contains Employability Skills

The required outcomes described in this unit of competency contain applicable facets of Employability Skills. The Employability Skills Summary of the qualification in which this unit of competency is packaged will assist in identifying Employability Skill requirements.

Elements and Performance Criteria Pre-Content

6) Elements describe the essential outcomes of a competency standard unit

Performance Criteria describe the required performance needed to demonstrate achievement of the element. Assessment of performance is to be consistent with the Evidence Guide.

Elements and Performance Criteria

ELEMENT		PERFORMANCE CRITERIA	
1	Prepare to test cord connected apparatus and cord assemblies	1.1	OHS procedures for a given work area are identified, obtained and understood.
		1.2	OHS risk control work preparation measures and procedures are followed.
		1.3	Advice is sought from an appropriate person to minimise disruption to the work place.
		1.4	Cord connected apparatus and cord assemblies to be tested are obtained.
		1.5	Portable apparatus testing device is checked for correct operation and safety.
2	Test cord connected apparatus and cord assemblies	2.1	OHS risk control work measures and procedures are followed.
		2.2	Measures are followed to ensure that cord

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ELEMENT	PERFORMANCE CRITERIA	
		connected apparatus and cord assemblies to be tested are not connected to the electrical supply.
	2.3	Knowledge of electrical safety requirements and parameters are applied to safety testing to ensure correct interpretation of test results.
	2.4	Visual checks of the cord connected apparatus and cord assemblies are carried out in accordance with established procedures to detect any abnormal or obvious damage or fault.
	2.5	Approval is obtained in accordance with established procedures from appropriate personnel, before any contingencies are implemented.
	2.6	Established PAT routines are followed to test cord connected apparatus and cord assemblies.
	2.7	Unsafe cord connected apparatus and cord assemblies are identified from test results
	2.8	Testing is undertaken effectively with minimum waste of energy and damage to apparatus.
3 Tag tested cord connected apparatus and cord assemblies and document testing activities	3.1	OHS work completion risk control measures and procedures are followed.
	3.2	Work site is cleaned and made safe in accordance with established procedures.
	3.3	Cord connected apparatus and cord assemblies are tagged according to their safety status.
	3.4	Arrangements are made for unsafe cord connected apparatus and cord assemblies to be repaired by a recognised competent person.
	3.5	Safety testing activities are documented in accordance with requirements and established routines procedures.

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Required Skills and Knowledge

REQUIRED SKILLS AND KNOWLEDGE

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REQUIRED SKILLS AND KNOWLEDGE

8) This describes the essential skills and knowledge and their level, required for this unit.

Evidence shall show that knowledge has been acquired of safe working practices and conduct in-service safety testing of electrical cord connected equipment and cord assemblies.

All knowledge and skills detailed in this unit should be contextualised to current industry practices and technologies.

KS01-EP026A Testing and Tagging Portable and Cord Connected Electrical Apparatus

Evidence shall show an understanding of testing and tagging portable and cord connected electrical apparatus to an extent indicated by the following aspects:

T1 Australian Standards and Commonwealth/State/Territory legislation and regulations encompassing:

- Australian Standard AS/NZS 3760
- Commonwealth/State/Territory Occupational Health and Safety Acts and Regulations
- Limitations of work that can be undertaken
- Codes of Practice and associated guidance material
- Risk management principles

T2 Basic electrical testing concepts encompassing:

- Basic electrical circuits
- Functions of electrical circuit
- Conductors and insulators
- Basic electrical supply system
- Relationship of electrical quantities
- Effects of electrical currents
- Methods/devices used to negate or minimise electrical shock
- Portable Appliance Testers (PAT)
- PAT maintenance and calibration

T3 Electrical equipment and cord assemblies testing encompassing:

- Classification of electrical equipment
- Inspection of electrical equipment (visual inspections)
- Using PAT:
  - Earth continuity testing
  - Insulation resistance testing
  - Polarity testing (extension cords and IEC cords)

T4 Testing and tagging documentation requirements encompassing:

- Risk assessment documentation

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REQUIRED SKILLS AND KNOWLEDGE

- frequency of inspection and testing
- tagging of equipment
- records maintenance

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Evidence Guide

EVIDENCE GUIDE

9) The evidence guide provides advice on assessment and must be read in conjunction with the Performance Criteria, Required Skills and Knowledge, the Range Statement and the Assessment Guidelines for this Training Package.

The Evidence Guide forms an integral part of this Unit and shall be used in conjunction with all components parts of this unit and performed in accordance with the Assessment Guidelines of this Training Package.

Overview of Assessment **9.1)**

Longitudinal competency development approaches to assessment, such as Profiling, require data to be reliably gathered in a form that can be consistently interpreted over time. This approach is best utilised in Apprenticeship programs and reduces assessment intervention. It is the industry-preferred model for apprenticeships. However, where summative (or final) assessment is used it is to include the application of the competency in the normal work environment or, at a minimum, the application of the competency in a realistically simulated work environment. In some circumstances, assessment in part or full can occur outside the workplace. However, it must be in accordance with industry and regulatory policy.

Methods chosen for a particular assessment will be influenced by various factors. These include the extent of the assessment, the most effective locations for the assessment activities to take place, access to physical resources, additional safety measures that may be required and the critical nature of the competencies being assessed.

The critical safety issues inherent in working with electricity, electrical equipment, gas or any other hazardous substance/material present a challenge for those determining competence. Sources of evidence need to be ‘rich’ in nature to minimise error in judgment.

Activities associated with normal everyday work influence decisions about how/how much the data gathered will contribute to its ‘richness’. Some skills are more critical to safety and operational requirements while the same skills may be more or less frequently practised. These points are raised for the assessors

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to consider when choosing an assessment method and developing assessment instruments. Sample assessment instruments are included for Assessors in the Assessment Guidelines of this Training Package.

Critical aspects of evidence required to demonstrate competency in this unit

9.2)

9.2)

Before the critical aspects of evidence are considered all prerequisites shall be met.

Evidence for competence in this unit shall be considered holistically. Each element and associated performance criteria shall be demonstrated on at least two occasions in accordance with the 'Assessment Guidelines – UEE11'. Evidence shall also comprise:

- A representative body of work performance demonstrated within the timeframes typically expected of the discipline, work function and industrial environment. In particular this shall incorporate evidence that shows a candidate is able to:
  - Implement Occupational Health and Safety workplace procedures and practices including the use of risk control measures as specified in the performance criteria and range statement
  - Apply sustainable energy principles and practices as specified in the performance criteria and range statement
  - Demonstrate an understanding of the essential knowledge and associated skills as described in this unit. It may be required by some jurisdictions that RTOs provide a percentile graded result for the purpose of regulatory or licensing requirements.
  - Demonstrate an appropriate level of skills enabling employment
  - Conduct work observing the relevant Anti Discrimination legislation, regulations, polices and workplace procedures
- Demonstrated consistent performance across a representative range of contexts from the prescribed items below:
  - Conduct in-service safety testing of electrical cord

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connected equipment and cord assemblies as described in 8) and including:

a. Preparing the portable apparatus tester
b. Connecting cords and apparatus to the testing apparatus
c. Using test results to establish the safety status
d. Identifying safe and unsafe cords and apparatus
e. Applying appropriate tagging
f. Documenting testing activities
g. Dealing with unplanned events by drawing on essential knowledge and skills to provide appropriate solutions incorporated in a holistic assessment with the above listed items

Note:

Successful completion of relevant vendor training may be used to contribute to evidence on which competency is deemed. In these cases the alignment of outcomes of vendor training with performance criteria and critical aspects of evidence shall be clearly identified.

Context of and specific resources for assessment

9.3)

This unit should be assessed as it relates to normal work practice using procedures, information and resources typical of a workplace. This should include:

- OHS policy and work procedures and instructions.
- Suitable work environment, facilities, equipment and materials to undertake actual work as prescribed by this unit.
- Workplace evidence to be produced in an industry/regulator approved recording system (logbook) confirming skills development under appropriate supervision

These should be part of the formal learning/assessment environment.

Note:

Where simulation is considered a suitable strategy for assessment, conditions must be authentic and as far as possible reproduce and replicate the workplace and be consistent with the approved industry simulation policy.

The resources used for assessment should reflect current industry practices in relation to conducting in-service safety testing of

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electrical cord connected equipment and cord assemblies.

Method of assessment **9.4)**

This unit shall be assessed by methods given in Volume 1, Part 3 'Assessment Guidelines'.

Note:

Competent performance with inherent safe working practices is expected in the Industry to which this unit applies. This requires assessment in a structured environment which is intended primarily for learning/assessment and incorporates all necessary equipment and facilities for learners to develop and demonstrate the essential knowledge and skills described in this unit.

Concurrent assessment and relationship with other units **9.5)**

There are no concurrent assessment recommendations for this unit.

Range Statement

RANGE STATEMENT

10) This relates to the unit as a whole providing the range of contexts and conditions to which the performance criteria apply. It allows for different work environments and situations that will affect performance.

This unit shall be demonstrated in relation to in-service safety testing of at least two different electrical cords and two different items of cord connected equipment with safety faults.

Safe Working. Safe procedures for working within in the scope of this unit shall be in accordance with AS/NZS 4836 'Safe working on low-voltage electrical installations.'

Generic terms used throughout this Vocational Standard shall be regarded as part of the Range Statement in which competency is demonstrated. The definition of these and other terms that apply are given in Volume 2, Part 2.1.

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Unit Sector(s)

Not applicable.

Competency Field

Competency Field **11)**

Restricted and Specialisations

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UEPMNT201 Carry out routine work activities in an electricity supply industry generation environment

Modification History

Release 1. This is the first release of this unit of competency in the UEP Generation Training Package.

Application

This unit involves the skills and knowledge required to undertake scheduled routine work activities in the electricity supply industry generation sector.

Routine work can include undertaking functions encompassing activities such as the operation of non-critical generation plant systems, lubricating plant and performing minor maintenance on both electrical and mechanical equipment. Tasks may also involve cleaning, warehousing, stock duties and the operation of load shifting equipment.

Competency in this unit requires the ability carry out routine work activities in an electrical supply generation environment. Individuals will work, under supervision, as an operator in a power generation facility.

No licensing, legislative or certification requirements apply to unit at the time of publication.

Note: Workplace practice

The application of the skills and knowledge described in this unit may require a licence or training permit to practice in the workplace where work is carried out on gas and electrical installations. Additional conditions may apply under state and territory legislative and regulatory licensing requirements.

Pre-requisite Unit

There are no prerequisite units.

Competency Field

Maintenance

Unit Sector

Electricity generation

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Elements and Performance Criteria

ELEMENTS	PERFORMANCE CRITERIA
Elements describe the essential outcomes.	Performance criteria describe the performance needed to demonstrate achievement of the element.
1 Prepare to undertake routine work activities	**1.1** Instructions for work activities, including permits to work, are identified and confirmed, in accordance with workplace procedures
	1.2 Work, Health and Safety(WHS)/Occupational Health and Safety (OHS) procedures are identified and confirmed for use, in accordance with workplace procedures
	1.3 Tools, equipment and Personnel Protective Equipment are identified and checked to ensure they are safe to use, in accordance with workplace procedures
	1.4 Appropriate personnel are consulted, in accordance with workplace procedures, to ensure work is coordinated at site with others
	1.5 Resources and materials are confirmed and obtained, in accordance with workplace procedures
	1.6 Schedule of work, including practices for working safely such as the use of Material Safety Data Sheets (MSDS), manual handling techniques and personal protective equipment are confirmed, in accordance with workplace procedures
2 Carry out work activities	**2.1** Hazards are identified and risk controls are implemented, in accordance with workplace procedures
	2.2 Schedule of work is followed, in accordance with workplace procedures, to ensure work activities are completed
	2.3 Work practices, applicable to electricity supply industry, are applied, in accordance with workplace procedures
	2.4 Instructions are sought, if required, in accordance with workplace procedures, from appropriate personnel when unplanned events occur
	2.5 Continuous checks on work quality are undertaken, in accordance with workplace procedures

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3 Check completed work activities	**3.1** Final checks are made to ensure work conforms with instructions and requirements
	3.2 Appropriate personnel are notified of work completion, in accordance with workplace procedures
	3.3 Tools, equipment, resources and materials are cleaned, checked and returned to storage, in accordance with workplace procedures
	3.4 Work area is cleaned and made safe, in accordance with workplace procedures, using sustainable energy practices
	3.5 Records are updated, in accordance with workplace procedures

Foundation Skills

Foundation skills essential to performance are explicit in the performance criteria of this unit of competency.

Range of Conditions

Range is restricted to essential operating conditions and any other variables essential to the work environment.

Non-essential conditions may be found in the Companion Volume Implementation Guide.

Unit Mapping Information

This unit replaces and is equivalent to UEPMNT201A Carry out routine work activities in an electricity supply industry generation environment.

Links

Companion Volume implementation guides are found in VETNet - https://vetnet.gov.au/Pages/TrainingDocs.aspx?q=1715b9fa-e7bd-441c-bb8d-cf22c9c825a8

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Assessment Requirements for UEPMNT201 Carry out routine work activities in an electricity supply industry generation environment

Modification History

Release 1. This is the first release of this unit of competency in the UEP Generation Training Package.

Performance Evidence

Evidence required to demonstrate competence in this unit must be relevant to and satisfy all the requirements of the elements, performance criteria and range of conditions on at least two separate occasions and includes:

- applying sustainable energy practices
- applying Work, Health and Safety (WHS)/Occupational Health and Safety (OHS) requirements including
  - emergency procedures
  - hazard identification
  - personal protective equipment (PPE)
  - risk control measures
  - safe working practices
- checking work results
- communicating with personnel
- completing lubrication, servicing and maintenance activities
- complying with legislation, industry standards, codes of practice and regulations
- dealing with unplanned events
- interpreting manufactures' specifications and manuals
- preparing to undertake routine work activities
- using permit to work system, Material Data Safety Sheets (MSDS) and manual handling techniques
- using tools, resources, materials and permits

Knowledge Evidence

Evidence required to demonstrate competence in this unit must be relevant to and satisfy all the requirements of the elements, performance criteria and range of conditions and includes knowledge of:

- cleaning methods and tools

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- cleaning solvents
- electrical supply industry routine tasks
- legislation, industry standards, codes of practice and regulations
- lubrication, service and maintenance requirements
- manual handling techniques
- manufacturers' specifications and manuals
- Material Data Safety Sheets (MSDS)
- permit to work system
- potential hazards
- sustainable energy practices
- types of power generation plant
- WHS/OHS legislated requirements including
  - emergency procedures
  - hazard identification
  - personal protective equipment
  - risk control measures
  - safe working practices
- workplace documentation
- workplace policies and procedures

Assessment Conditions

As a minimum, assessors must satisfy applicable regulatory requirements, which include requirements in the Standards for Registered Training Organisations current at the time of assessment.

As a minimum, assessment must satisfy applicable regulatory requirements, which include requirements in the Standards for Registered Training Organisations current at the time of assessment.

Assessment processes and techniques must be appropriate to the language, literacy and numeracy requirements of the work being performed and the needs of the candidate.

Assessment must occur in workplace operational situations. Where this is not appropriate, assessment must occur in simulated workplace operational situations that reflect workplace conditions.

Resources for assessment must include access to:

- a range of relevant exercises, case studies and/or other simulations
- relevant and appropriate materials, tools, equipment and personal protective equipment currently used in industry
- applicable documentation including workplace procedures, industry standards, equipment specifications, regulations, codes of practice and operation manuals.

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Links

Companion Volume implementation guides are found in VETNet - https://vetnet.gov.au/Pages/TrainingDocs.aspx?q=1715b9fa-e7bd-441c-bb8d-cf22c9c825a8

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UEPMNT202 Carry out routine work activities in an ESI large scale wind generation environment

Modification History

Release 1. This is the first release of this unit of competency in the UEP Generation Training Package.

Application

This unit involves the skills and knowledge required to undertake scheduled routine work activities in the Electricity Supply Industry (ESI) - large scale wind generation environment.

Routine work activities can include undertaking tasks such as the operation of non-critical plant systems, lubricating plant, performing minor maintenance on electrical and mechanical equipment, cleaning plant, performing warehousing stock duties and operating mobile load shifting equipment.

Competency in this unit requires the ability carry out routine work activities in an electrical supply generation environment - wind. Individuals will work, under supervision, as a maintenance operative in a power generation facility.

No licensing, legislative or certification requirements apply to this unit at the time of publication.

Note: Workplace practice

The application of the skills and knowledge described in this unit may require a licence or training permit to practice in the workplace where work is carried out on gas and electrical installations. Additional conditions may apply under state and territory legislative and regulatory licensing requirements.

Pre-requisite Unit

There are no prerequisite units.

Competency Field

Maintenance

Unit Sector

Electricity generation

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Elements and Performance Criteria

ELEMENTS	PERFORMANCE CRITERIA
Elements describe the essential outcomes.	Performance criteria describe the performance needed to demonstrate achievement of the element.
1 Prepare to undertake routine work activities	**1.1** Instructions for work activities are identified and confirmed, in accordance with workplace procedures
	1.2 Work, Health and Safety (WHS)/Occupational Health and Safety (OHS) policies and procedures are identified and confirmed for use, in accordance with workplace procedures
	1.3 Tools, equipment and personnel protective equipment are identified and checked to ensure they are safe to use, in accordance with workplace procedures
	1.4 Resources and materials are identified and obtained, in accordance with workplace procedures
	1.5 Schedule of work, including practices for working safely such as use of Safety Data Sheets (SDS)/Material Safety Data Sheets (MSDS) and manual handling techniques, are confirmed, in accordance with workplace procedures
2 Carry out work activities	**2.1** Hazards are identified and risk controls are implemented, in accordance with workplace procedures
	2.2 Schedule of work is followed, in accordance with workplace procedures, to ensure work activities are completed to an agreed time frame, quality standard and minimum of waste
	2.3 Workplace procedures and practices, applicable to electricity supply by wind generation are applied
	2.4 Instructions are sought, if required, from appropriate personnel, in accordance with workplace procedures, in the event of unplanned events
	2.5 Regular checks of work quality are undertaken, in accordance with workplace procedures
3 Check completed work activities	**3.1** Appropriate personnel are notified of task completion, in accordance with workplace procedures
	3.2 Tools, equipment, surplus resources and materials are cleaned, checked and returned to storage, in accordance

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with workplace procedures

3.3 Work area is cleaned up and made safe, in accordance with workplace procedures, using sustainable energy practices

3.4 Records are updated, in accordance with workplace procedures

Foundation Skills

Foundation skills essential to performance are explicit in the performance criteria of this unit of competency.

Range of Conditions

Range is restricted to essential operating conditions and any other variables essential to the work environment.

Non-essential conditions may be found in the Companion Volume Implementation Guide.

Unit Mapping Information

This unit replaces and is equivalent to UEPMNT202A Carry out routine work activities in an ESI large scale wind generation environment.

Links

Companion Volume implementation guides are found in VETNet - https://vetnet.gov.au/Pages/TrainingDocs.aspx?q=1715b9fa-e7bd-441c-bb8d-cf22c9c825a8

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Assessment Requirements for UEPMNT202 Carry out routine work activities in an ESI large scale wind generation environment

Modification History

Release 1. This is the first release of this unit of competency in the UEP Generation Training Package.

Performance Evidence

Evidence required to demonstrate competence in this unit must be relevant to and satisfy all the requirements of the elements, performance criteria and range of conditions on at least two separate occasions and includes:

- applying Work, Health and Safety (WHS)/Occupational Health and Safety (OHS) requirements including:
  - emergency procedures
  - identifying hazards
  - risk control measures
  - safe working practices
- carrying out routine work activities including servicing and maintenance tasks
- checking results
- communicating with personnel
- completing work
- complying with legislation, industry standards, codes of practice and regulations
- interpreting manufactures' specifications and manuals
- performing routine activities using Safety Data Sheets (SDS)/Material Safety Data Sheets (MSDS)
- preparing to undertake routine work activities
- using tools, resources, materials and personal protective equipment
- working with maintenance schedules

Knowledge Evidence

Evidence required to demonstrate competence in this unit must be relevant to and satisfy all the requirements of the elements, performance criteria and range of conditions and includes knowledge of:

- legislation, industry standards, codes of practice and regulations
- maintenance schedules
- manufacturers' specifications and manuals workplace documentation
- routine work activities including servicing and maintenance tasks
- Safety Data Sheets (SDS)/Material Data Safety Sheets (MSDS)

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- tools, resources, materials and personal protective equipment
- WHS/OHS legislated requirements including:
  - emergency procedures
  - identifying hazards
  - risk control measures
  - safe working practices
- wind generation, types and characteristics
- workplace policies and procedures

Assessment Conditions

As a minimum, assessors must satisfy applicable regulatory requirements, which include requirements in the Standards for Registered Training Organisations current at the time of assessment.

As a minimum, assessment must satisfy applicable regulatory requirements, which include requirements in the Standards for Registered Training Organisations current at the time of assessment.

Assessment processes and techniques must be appropriate to the language, literacy and numeracy requirements of the work being performed and the needs of the candidate.

Assessment must occur in workplace operational situations. Where this is not appropriate, assessment must occur in simulated workplace operational situations that reflect workplace conditions.

- Resources for assessment must include access to: a range of relevant exercises, case studies and/or other simulations
- relevant and appropriate materials, tools, equipment and personal protective equipment currently used in industry applicable documentation including workplace procedures, industry standards, equipment specifications, regulations, codes of practice and operation manuals.

Links

Companion Volume implementation guides are found in VETNet - https://vetnet.gov.au/Pages/TrainingDocs.aspx?q=1715b9fa-e7bd-441c-bb8d-cf22c9c825a8

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UEPMNT302 Install and maintain industrial pipe work

Modification History

Release 1. This is the first release of this unit of competency in the UEP Generation Training Package.

Application

This unit involves the skills and knowledge required to undertake work associated with the installation, maintenance and fabrication of industrial pipe work, which may also involve fault finding and repairs.

Industrial piping is used to convey fluids, liquids and gases from one location to another. Pipe fabrication is the process of making and assembling industrial pipe work to suit each power generation facility's requirements.

Competency in this unit requires the ability to plan work, fabricate and install industrial pipe work, maintain industrial pipe work and to report on all completed work tasks. Individuals will, in general, work under supervision in an electrical, electronic and/or mechanical equipment repair workshop or no site

Power generation maintenance personnel are typically trained and authorised to receive permits to work.

No licensing, legislative or certification requirements apply to this unit at the time of publication.

Note: Workplace practice

The application of the skills and knowledge described in this unit may require a licence or training permit to practice in the workplace where work is carried out on gas and electrical installations. Additional conditions may apply under state and territory legislative and regulatory licensing requirements.

Pre-requisite Unit

MEM18006C Repair and fit engineering components

MEM09002B Interpret technical drawing

MEM12023A Perform engineering measurements

MEM18001C Use hand tools

MEM18002B Use power tools/hand held operations

MEM18003C Use tools for precision work

MEM18055B Dismantle, replace and assemble engineering components

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Competency Field

Maintenance

Unit Sector

Electricity generation

Elements and Performance Criteria

ELEMENTS	PERFORMANCE CRITERIA
Elements describe the essential outcomes.	Performance criteria describe the performance needed to demonstrate achievement of the element.
1 Plan and prepare for work	**1.1** Requirements including scope of work and assigned roles are identified and confirmed with appropriate personnel or by site inspection, in accordance with workplace procedures
	1.2 Occupational Health and Safety (OHS)/Work, Health and Safety (WHS) regulations, legislative requirements, industry standards, codes of practice, manufacturers' specifications, environmental obligations and workplace procedures are reviewed in preparation for work
	1.3 Resources are obtained and inspected for compliance with job specification
	1.4 Relevant plans, drawings and manuals are selected and used, in accordance with the work procedures
	1.5 Correct materials and components for work are obtained and inspected, in accordance with workplace procedures, for compliance with job specification
	1.6 Work is planned, sequenced and prioritised, in accordance with workplace
	1.7 Potential hazards are identified, and risk control measures, are selected and implemented, in accordance with workplace procedures
	1.8 Work area is prepared, in accordance with workplace procedures
2 Fabricate and install pipe	**2.1** Isolations are confirmed, where appropriate, in

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work		accordance with workplace procedures
	2.2	Pipe runs are identified, calculations performed and sketches made of planned installation in accordance with workplace procedures
	2.3	Pipe work is fabricated, using appropriate techniques and equipment, in accordance with workplace procedures
	2.4	Pipe work is levelled and aligned, and installed or coupled, in accordance with the workplace procedures
3 Maintain industrial pipework	**3.1**	Pipe work found to be faulty is repaired and replaced to conform to site requirements or manufacturers' specifications, in accordance with workplace procedures
	3.2	Pipe work modifications and alterations are undertaken, in accordance with workplace procedures, site requirements and manufacturers' specifications
	3.3	Machinery and/or plant is returned to service, and pipe work is monitored and adjusted, in accordance with workplace procedures
4 Complete work	**4.1**	Work is completed, and appropriate personnel notified, in accordance with workplace procedures
	4.2	Work area is cleared of waste, cleaned, restored and secured, in accordance with workplace procedures
	4.3	Tools and equipment are cleaned, maintained and stored, in accordance with workplace procedures
	4.4	Work completion details are finalised, in accordance with workplace procedures

Foundation Skills

Foundation skills essential to performance are explicit in the performance criteria of this unit of competency.

Range of Conditions

Range is restricted to essential operating conditions and any other variables essential to the work environment.

Non-essential conditions may be found in the Companion Volume Implementation Guide.

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Unit Mapping Information

This unit replaces and is equivalent to UEPMNT302B Install and maintain industrial pipe work.

Links

Companion Volume implementation guides are found in VETNet - https://vetnet.gov.au/Pages/TrainingDocs.aspx?q=1715b9fa-e7bd-441c-bb8d-cf22c9c825a8

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Assessment Requirements for UEPMNT302 Install and maintain industrial pipe work

Modification History

Release 1. This is the first release of this unit of competency in the UEP Generation Training Package.

Performance Evidence

Evidence required to demonstrate competence in this unit must be relevant to and satisfy all the requirements of the elements, performance criteria and range of conditions on at least two separate occasions and includes:

- analysing data using analysis techniques
- applying Work, Health and Safety (WHS)/Occupational Health and Safety (OHS) requirements including:
  - emergency procedures
  - hazard identification
  - risk control measures
  - safe working practices
- communicating with personnel
- completing work as per scheduled requirements
- determining work to permit requirements
- dismantling and reassembling industrial pipework using approved techniques
- fabricating and installing industrial pipe work using installation and fabrication techniques and procedures maintain industrial pipe work using maintenance techniques and procedures
- fabricating and installing industrial pipework
- implementing legislation, relevant industry standards, codes of practice and regulations
- interpreting manufacturers' specifications and manuals
- interpreting technical drawings and data
- planning for installation and maintenance pipe work
- recognising worn or damaged components
- selecting materials and components
- undertaking measurements with measuring equipment
- using tools
- utilising testing techniques
- working with pipe levelling and alignment techniques

Knowledge Evidence

Evidence required to demonstrate competence in this unit must be relevant to and satisfy all the

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requirements of the elements, performance criteria and range of conditions and includes knowledge of:

- data analysis techniques
- isolations
- legislation, industry standards, codes of practices and regulations
- maintenance of industrial pipework
- manufacturers' specifications and manuals
- materials and components
- measuring equipment
- permit to work system
- pipe levelling and alignment techniques
- pipe work fabrication and installation techniques
- technical drawings and plans
- techniques for dismantling and reassembling industrial pipes recognition of worn or damaged components
- testing techniques
- tools
- types and characteristics of industrial pipe work
- WHS/OHS legislated requirements including:
  - emergency procedures
  - hazard identification
  - risk control measures
  - safe working practices
- workplace documentation
- workplace policies and procedures

Assessment Conditions

As a minimum, assessors must satisfy applicable regulatory requirements, which include requirements in the Standards for Registered Training Organisations current at the time of assessment.

As a minimum, assessment must satisfy applicable regulatory requirements, which include requirements in the Standards for Registered Training Organisations current at the time of assessment.

Assessment processes and techniques must be appropriate to the language, literacy and numeracy requirements of the work being performed and the needs of the candidate.

Assessment must occur in workplace operational situations. Where this is not appropriate, assessment must occur in simulated workplace operational situations that reflect workplace conditions. Resources for assessment must include access to:

- a range of relevant exercises, case studies and/or other simulations
- applicable documentation including workplace procedures, industry standards, equipment specifications, regulations, codes of practice and operation manuals.

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- relevant and appropriate materials, tools, equipment and personal protective equipment currently used in industry

Links

Companion Volume implementation guides are found in VETNet - https://vetnet.gov.au/Pages/TrainingDocs.aspx?q=1715b9fa-e7bd-441c-bb8d-cf22c9c825a8

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UEPMNT303 Maintain mechanical valves

Modification History

Release 1. This is the first release of this unit of competency in the UEP Generation Training Package.

Application

This unit involves the skills and knowledge required to undertake fault finding, diagnosis, repair and/or overhaul of mechanical valves, excluding any associated servo or actuating unit.

Fault finding is the process of undertaking an investigation into the cause of a mechanical valve malfunction and then performing repairs to ensure optimal performance of equipment and plant.

Competency in this unit requires the ability to plan work, remove mechanical valves for maintenance, perform mechanical valve maintenance, replace and/or install valves and to report on all completed work tasks. Individuals will, in general, work under supervision in an electrical, electronic and/or mechanical equipment repair workshop or on site.

Power generation maintenance personnel are typically trained and authorised to receive permits to work.

No licensing, legislative or certification requirements apply to this unit at the time of publication.

Note: Workplace practice

The application of the skills and knowledge described in this unit may require a licence or training permit to practice in the workplace where work is carried out on gas and electrical installations. Additional conditions may apply under state and territory legislative and regulatory licensing requirements.

Pre-requisite Unit

MEM18006C Repair and fit engineering components

MEM09002B Interpret technical drawing

MEM12023A Perform engineering measurements

MEM18001C Use hand tools

MEM18002B Use power tools/hand held operations

MEM18003C Use tools for precision work

MEM18055B Dismantle, replace and assemble engineering components

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Competency Field

Maintenance

Unit Sector

Electricity generation

Elements and Performance Criteria

ELEMENTS	PERFORMANCE CRITERIA
Elements describe the essential outcomes.	Performance criteria describe the performance needed to demonstrate achievement of the element.
1 Plan and prepare for work	**1.1** Requirements including scope of work and assigned roles are identified and confirmed with appropriate personnel or by site inspection, in accordance with workplace procedures
	1.2 Work, Health and Safety (WHS)/Occupational Health and Safety (OHS) regulations, legislative requirements, industry standards, codes of practice, manufacturers' specifications, environmental obligations and workplace procedures are reviewed in preparation for work
	1.3 Resources for work activities are obtained and inspected for compliance with the job specification
	1.4 Relevant plans, drawings and manuals are selected and used, in accordance with the work procedures
	1.5 Correct materials and components for work are obtained and inspected, in accordance with workplace procedures, for compliance with job specification
	1.6 Work is planned, sequenced and prioritised, in accordance with workplace procedures
	1.7 Potential hazards are identified and risk control measures are selected and implemented, in accordance with workplace procedures
	1.8 Work area is prepared, in accordance with workplace procedures
2 Remove mechanical valves	**2.1** Isolations are confirmed, where appropriate, in

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for maintenance		accordance with workplace procedures
	2.2	Mechanical valve is disconnected, in accordance with workplace procedures
	2.3	Mechanical valve is removed, in a manner which will assist in replacement, in accordance with the workplace procedures
	2.4	Mechanical valve is inspected for abnormalities, in accordance with the workplace procedures
3 Perform mechanical valve maintenance	**3.1**	Maintenance is performed, in accordance with manufacturers' specification and workplace procedures
	3.2	Mechanical valve is dismantled, clearly marked for identification, and relevant sketches are drawn, in accordance with workplace procedures
	3.3	Components are prepared for reassembly, in accordance with manufacturers' drawings and/or manuals and workplace procedures
	3.4	New components are inspected, in accordance with workplace procedures, to ensure compliance with manufacturers' specification
	3.5	Dimensional inspection is performed with precision measuring devices, in accordance with workplace procedures, to ensure compliance with manufacturers' specification and
	3.6	Components are reassembled for testing, in accordance with manufacturers' specification and workplace procedures
	3.7	Modifications and/or alterations are undertaken, in accordance with manufacturers' specification and workplace procedures
	3.8	Components are levelled, aligned, coupled and connected, in accordance with manufacturers' specifications and workplace procedures
	3.9	Valves are pressure tested, monitored and adjusted, if required, in accordance with manufacturers' specifications and workplace procedures
4 Replace or install	**4.1**	Equipment is prepared for valve replacement, in

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mechanical valves		accordance with workplace procedures
	4.2	Mechanical valve is replaced, in accordance with manufacturers' specification and workplace procedures
	4.3	Mechanical valve is connected, in accordance with manufacturers' specification and workplace procedures
	4.4	Final inspection is completed, in accordance with workplace procedures
5 Complete work	**5.1**	Work is completed, and appropriate personnel are notified, in accordance with workplace procedures
	5.2	Work area is cleared of waste, cleaned, restored and secured, in accordance with workplace procedures
	5.3	Tools and equipment are cleaned, maintained and stored, in accordance with workplace procedures
	5.4	Work completion details are finalised, in accordance with workplace procedures

Foundation Skills

Foundation skills essential to performance are explicit in the performance criteria of this unit of competency.

Range of Conditions

Range is restricted to essential operating conditions and any other variables essential to the work environment.

Non-essential conditions may be found in the Companion Volume Implementation Guide.

Unit Mapping Information

This unit replaces and is equivalent to UEPMNT303B Maintain mechanical valves.

Links

Companion Volume implementation guides are found in VETNet - https://vetnet.gov.au/Pages/TrainingDocs.aspx?q=1715b9fa-e7bd-441c-bb8d-cf22c9c825a8

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Assessment Requirements for UEPMNT303 Maintain mechanical valves

Modification History

Release 1. This is the first release of this unit of competency in the UEP Generation Training Package.

Performance Evidence

Evidence required to demonstrate competence in this unit must be relevant to and satisfy all the requirements of the elements, performance criteria and range of conditions on at least two separate occasions and includes:

- applying Work, Health and Safety (WHS)/Occupational Health and Safety (OHS) requirements including:
  - emergency procedures
  - identifying hazards
  - risk control measures
  - safe working practices
- communicating with personnel
- completing work as per scheduled requirements
- determining work to permit requirements
- dismantling and reassembling mechanical valves
- implementing legislation, industry standards, codes of practice and regulations
- interpreting technical drawings, plans, manufacturers' specifications and manuals
- levelling and aligning valves using approved techniques
- manufacturing and installing seals and gaskets
- performing valve maintenance using maintenance techniques and procedures
- planning for mechanical valve maintenance work
- recognising worn or damaged components
- removing valves for maintenance using removal techniques and procedures
- replacing and installing valves using installation techniques and procedures
- selecting materials and components
- testing mechanical valves and equipment
- undertaking evaluations using data analysis techniques
- working with tools and precision measuring equipment

Knowledge Evidence

Evidence required to demonstrate competence in this unit must be relevant to and satisfy all the requirements of the elements, performance criteria and range of conditions and includes

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knowledge of:

- data analysis techniques
- dismantling and reassembling techniques
- isolations
- manufacture and installation of seals and gaskets
- manufacturers' specifications and manuals legislation, industry standards, codes of practice and regulations
- materials and components
- measurement equipment
- permit to work system
- recognition of worn or damaged components
- technical drawings and plans
- test techniques
- types of mechanical valves and characteristics
- typical arrangements of power production plant
- use of tools
- valve installation techniques
- valve levelling and alignment techniques
- WHS/OHS legislated requirements including:
  - emergency procedures
  - identifying hazards
  - risk control measures
  - safe working practices
- workplace documentation,
- workplace policies and procedures

Assessment Conditions

As a minimum, assessors must satisfy applicable regulatory requirements, which include requirements in the Standards for Registered Training Organisations current at the time of assessment.

As a minimum, assessment must satisfy applicable regulatory requirements, which include requirements in the Standards for Registered Training Organisations current at the time of assessment.

Assessment processes and techniques must be appropriate to the language, literacy and numeracy requirements of the work being performed and the needs of the candidate.

Assessment must occur in workplace operational situations. Where this is not appropriate, assessment must occur in simulated workplace operational situations that reflect workplace conditions. Resources for assessment must include access to:

- a range of relevant exercises, case studies and/or other simulations
- applicable documentation including workplace procedures, industry standards, equipment

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specifications, regulations, codes of practice and operation manuals.
- relevant and appropriate materials, tools, equipment and personal protective equipment currently used in industry

Links

Companion Volume implementation guides are found in VETNet - https://vetnet.gov.au/Pages/TrainingDocs.aspx?q=1715b9fa-e7bd-441c-bb8d-cf22c9c825a8

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UEPMNT304 Maintain mechanical pumps

Modification History

Release 1. This is the first release of this unit of competency in the UEP Generation Training Package.

Application

This unit involves the skills and knowledge required to undertake the installation and maintenance of mechanical pumps (no more than basic alignment). Pump maintenance, including installation, is undertaken to ensure optimal performance of equipment and plant in a power generation facility.

Competency in this unit requires the ability to plan work, remove mechanical pumps for maintenance, maintain mechanical pumps, replace and/or install mechanical pumps and to report on all completed work tasks. Individuals will, in general, work under supervision in an electrical, electronic and/or mechanical equipment repair workshop or on site.

Power generation maintenance personnel are typically trained and authorised to receive permits to work.

No licensing, legislative or certification requirements apply to this unit at the time of publication.

Note: Workplace practice

The application of the skills and knowledge described in this unit may require a licence or training permit to practice in the workplace where work is carried out on gas and electrical installations. Additional conditions may apply under state and territory legislative and regulatory licensing requirements.

Pre-requisite Unit

MEM18006C Repair and fit engineering components

MEM09002B Interpret technical drawing

MEM12023A Perform engineering measurements

MEM18001C Use hand tools

MEM18002B Use power tools/hand held operations

MEM18003C Use tools for precision work

MEM18055B Dismantle, replace and assemble engineering components

Competency Field

Maintenance

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Unit Sector

Electricity generation

Elements and Performance Criteria

ELEMENTS	PERFORMANCE CRITERIA
Elements describe the essential outcomes.	Performance criteria describe the performance needed to demonstrate achievement of the element.
1 Plan and prepare for work	**1.1** Requirements including scope of work and assigned roles are identified and confirmed with appropriate personnel or by site inspection, in accordance with workplace procedures
	1.2 Work, Health and Safety (WHS)/Occupational Health and Safety (OHS) regulations, legislative requirements, industry standards, codes of practice, manufacturers' specifications, environmental obligations and workplace procedures are reviewed in preparation for work
	1.3 Resources are obtained and inspected for compliance with job specification
	1.4 Relevant plans, drawings and manuals are selected and used, in accordance with workplace procedures
	1.5 Correct materials and components for work are obtained and inspected, in accordance with workplace procedures, for compliance with job specification
	1.6 Work is planned, sequenced and prioritised, in accordance with workplace procedures
	1.7 Potential hazards are identified and risk control measures are selected and implemented, in accordance with workplace procedures
	1.8 Work area is prepared, in accordance with workplace procedures
2 Remove mechanical pumps for maintenance	**2.1** Isolations are confirmed, where appropriate, in accordance with workplace procedures and site requirements
	2.2 Mechanical pump is disconnected, in accordance with the workplace procedures

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	2.3 Mechanical pump is removed, in a manner which will assist in replacement, in accordance with workplace procedures
	2.4 Mechanical pump is inspected for abnormalities, in accordance with workplace procedures
3 Maintain mechanical pumps	**3.1** Maintenance is performed, in accordance with manufacturers' specification and workplace procedures
	3.2 Mechanical pump is dismantled, in accordance with manufacturers' specification and workplace procedures
	3.3 Sketches are made, data is noted and components are marked for identification or reassembly, in accordance with workplace procedures
	3.4 New components are inspected for compliance, in accordance with workplace procedures and manufacturers' specifications
	3.5 Dimensional inspection is performed, with precision measuring devices, in accordance with workplace procedures, to ensure compliance with manufacturers' specifications and results are recorded
	3.6 Mechanical pump is reassembled, applying appropriate principles and techniques, in accordance with workplace procedures and manufacturers' specifications
	3.7 Modifications and/or alterations to mechanical pump are undertaken, in accordance with workplace procedures
4 Replace or install mechanical pumps	**4.1** Equipment is prepared for pump replacement, in accordance with workplace procedures
	4.2 Mechanical pump is replaced, in accordance with workplace procedures and manufacturers' specification
	4.3 Mechanical pump is levelled, aligned, coupled and connected, in accordance with workplace procedures
	4.4 All fastenings are torqued, in accordance with workplace procedures and manufacturers' specifications
	4.5 Machinery and/or plant, including mechanical pump, are given a test run, and are monitored and adjusted, as required, in accordance with workplace procedures and manufacturers' specifications

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5 Complete work	**5.1** Work is completed, and appropriate personnel are notified, in accordance with workplace procedures
	5.2 Work area is cleared of waste, cleaned, restored and secured, in accordance with workplace procedures
	5.3 Tools and equipment are maintained and stored, in accordance with workplace procedures
	5.4 Work completion details are finalised, in accordance with workplace procedures

Foundation Skills

Foundation skills essential to performance are explicit in the performance criteria of this unit of competency.

Range of Conditions

Range is restricted to essential operating conditions and any other variables essential to the work environment.

Non-essential conditions may be found in the Companion Volume Implementation Guide.

Unit Mapping Information

This unit replaces and is equivalent to UEPMNT304B Maintain mechanical pumps.

Links

Companion Volume implementation guides are found in VETNet - https://vetnet.gov.au/Pages/TrainingDocs.aspx?q=1715b9fa-e7bd-441c-bb8d-cf22c9c825a8

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Assessment Requirements for UEPMNT304 Maintain mechanical pumps

Modification History

Release 1. This is the first release of this unit of competency in the UEP Generation Training Package.

Performance Evidence

Evidence required to demonstrate competence in this unit must be relevant to and satisfy all the requirements of the elements, performance criteria and range of conditions on at least two separate occasions and includes:

- applying Work, Health and Safety (WHS)/Occupational Health and Safety (OHS) requirements including:
  - emergency procedures
  - hazard identification
  - risk control measures
  - safe working practices
- applying coupling levelling and alignment techniques
- communicating with personnel
- completing work in line with schedules
- determining data analysis techniques and tools
- dismantling and reassembling techniques
- identifying resources and materials
- implementing legislation, industry standards, codes of practice and regulations
- interpreting technical drawings, manufactures' specifications and manuals
- manufacturing and installing seals and gaskets
- recognising worn or damaged components
- removing and maintaining mechanical pumps
- replacing or installing mechanical pumps
- selecting materials and components
- using precision measuring equipment
- using removal and maintenance techniques and procedures
- using tools including specialised tools and jigs
- utilising permit to work system
- working with defined tolerances

Knowledge Evidence

Evidence required to demonstrate competence in this unit must be relevant to and satisfy all the

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requirements of the elements, performance criteria and range of conditions and includes knowledge of:

- data analysis techniques and tools
- defined tolerances
- dismantle and reassemble techniques
- legislation, industry standards, codes of practice and regulations
- maintenance of mechanical pumps
- manufacture and installation of seals and gaskets
- manufacturers' specifications and manuals
- materials and components
- permit to work system
- precision measuring equipment
- resources and materials
- technical drawings
- techniques for coupling, levelling and alignment
- tools including specialised tools and jigs
- WHS/OHS legislated requirements including:
  - emergency procedures
  - hazard identification
  - risk control measures
  - safe working practices
- workplace documentation,
- workplace policies and procedures
- worn or damaged components

Assessment Conditions

As a minimum, assessors must satisfy applicable regulatory requirements, which include requirements in the Standards for Registered Training Organisations current at the time of assessment.

As a minimum, assessment must satisfy applicable regulatory requirements, which include requirements in the Standards for Registered Training Organisations current at the time of assessment.

Assessment processes and techniques must be appropriate to the language, literacy and numeracy requirements of the work being performed and the needs of the candidate.

Assessment must occur in workplace operational situations. Where this is not appropriate, assessment must occur in simulated workplace operational situations that reflect workplace conditions. Resources for assessment must include access to:

- a range of relevant exercises, case studies and/or other simulations
- applicable documentation including workplace procedures, industry standards, equipment specifications, regulations, codes of practice and operation manuals.
- relevant and appropriate materials, tools, equipment and personal protective equipment

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currently used in industry

Links

Companion Volume implementation guides are found in VETNet - https://vetnet.gov.au/Pages/TrainingDocs.aspx?q=1715b9fa-e7bd-441c-bb8d-cf22c9c825a8

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UEPMNT305 Maintain industrial fans

Modification History

Release 1. This is the first release of this unit of competency in the UEP Generation Training Package.

Application

This unit involves the skills and knowledge required to maintain and/or overhaul industrial fans. It may involve fault finding, diagnosis, repair and may require the removal and replacement of rotating elements with modulating controls.

Industrial fans typically provide a large flow of air or gas to power or cool a power generation facility's plant and equipment. The diagnosis and repair of faults requires the systematic investigation of any industrial fan malfunction.

Competency in this unit requires the ability to plan work, remove industrial fans for maintenance, maintain industrial fans, replace and/or install industrial fans and to report on all completed work tasks. Individuals will, in general, work under supervision in an electrical, electronic and/or mechanical equipment repair workshop or on site.

Power generation maintenance personnel are typically trained and authorised to receive permits to work.

No licensing, legislative or certification requirements apply to this unit at the time of publication.

Note: Workplace practice

The application of the skills and knowledge described in this unit of competency may require a licence or training permit to practice in the workplace, where work is carried out on gas and electrical installations. Additional and/or other conditions may apply under state and territory legislative and regulatory licensing requirements.

Pre-requisite Unit

MEM18006C Repair and fit engineering components

MEM09002B Interpret technical drawing

MEM12023A Perform engineering measurements

MEM18001C Use hand tools

MEM18002B Use power tools/hand held operations

MEM18003C Use tools for precision work

MEM18055B Dismantle, replace and assemble engineering components

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Competency Field

Maintenance

Unit Sector

Electricity generation

Elements and Performance Criteria

ELEMENTS	PERFORMANCE CRITERIA
Elements describe the essential outcomes.	Performance criteria describe the performance needed to demonstrate achievement of the element.
1 Plan and prepare for work	**1.1** Requirements including scope of work and assigned roles are identified and confirmed with appropriate personnel or by site inspection, in accordance with workplace procedures
	1.2 Occupational Health and Safety(OHS)/Work, Health and Safety (WHS) regulations, legislative requirements, industry standards, codes of practice, manufacturers' specifications, environmental obligations and workplace procedures are reviewed in preparation for work
	1.3 Resources for work activities are obtained and inspected for compliance with job specification
	1.4 Relevant plans, drawings and manuals are selected and used, in accordance with the workplace procedures
	1.5 Correct materials and components for work are obtained and inspected, in accordance with workplace procedures, for compliance with job specification
	1.6 Work is planned, sequenced and prioritised, in accordance with workplace procedures
	1.7 Potential hazards are identified, and risk control measures are selected and implemented, in accordance with workplace procedures
	1.8 Work area is prepared, in accordance with workplace procedures
2 Remove industrial fan for	**2.1** Isolations are confirmed, where appropriate, in

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maintenance		accordance with workplace procedures
	2.2	Industrial fans are disconnected, in accordance with workplace procedures
	2.3	Industrial fans are removed, in a manner which will assist in replacement, in accordance with workplace procedures
	2.4	Industrial fans are inspected for abnormalities, in accordance with workplace procedures
3 Maintain industrial fans	**3.1**	Maintenance is performed on industrial fans, in accordance with manufacturers' specification and workplace procedures
	3.2	Components are disassembled or assembled and preliminary balance of equipment is obtained, maintained and adjusted by assembling components of an appropriate weight, in accordance with workplace procedures and manufacturers' specification
	3.3	Sketches are made, data noted and components are marked for identification or reassembly, in accordance with workplace procedures
	3.4	New components are obtained and inspected for compliance with manufacturers' specification, in accordance with workplace procedures
	3.5	Dimensional inspection is performed with precision measuring devices to ensure compliance with manufacturers' specifications and results are recorded, in accordance with workplace procedures
	3.6	Industrial fans are reassembled, applying appropriate principles and techniques, in accordance with workplace procedures and manufacturers' specifications
	3.7	Modifications or alterations to industrial fans are undertaken, in accordance with workplace procedures
4 Replace or install industrial fans	**4.1**	Equipment is prepared for industrial fan replacement, in accordance with workplace procedures
	4.2	Industrial fans are replaced, in accordance with workplace procedures and manufacturers' specification
	4.3	Industrial fans are levelled, aligned, coupled and

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		connected, in accordance with workplace procedures
	4.4	All fastenings are torqued, in accordance with workplace procedures and manufacturers' specification
	4.5	Machinery, plant and industrial fans are given a test run, monitored and adjusted, as required, in accordance with workplace procedures and manufacturers' specification
5 Complete work	**5.1**	Work is completed, and appropriate personnel are notified, in accordance with workplace procedures
	5.2	Work area is cleared of waste, cleaned, restored and secured, in accordance with workplace procedures
	5.3	Tools and equipment are maintained and stored, in accordance with workplace procedures
	5.4	Work completion details are finalised, in accordance with workplace procedures

Foundation Skills

Foundation skills essential to performance are explicit in the performance criteria of this unit of competency.

Range of Conditions

Range is restricted to essential operating conditions and any other variables essential to the work environment.

Non-essential conditions may be found in the Companion Volume Implementation Guide.

Unit Mapping Information

This unit replaces and is equivalent to UEPMNT305B Maintain industrial fans.

Links

Companion Volume implementation guides are found in VETNet - https://vetnet.gov.au/Pages/TrainingDocs.aspx?q=1715b9fa-e7bd-441c-bb8d-cf22c9c825a8

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Assessment Requirements for UEPMNT305 Maintain industrial fans

Modification History

Release 1. This is the first release of this unit of competency in the UEP Generation Training Package.

Performance Evidence

Evidence required to demonstrate competence in this unit must be relevant to and satisfy all the requirements of the elements, performance criteria and range of conditions on at least two separate occasions and includes:

- applying Work, Health and Safety (WHS)/Occupational Health and Safety (OHS) requirements including:
  - emergency procedures
  - hazard identification
  - risk control measures
  - safe working practices
- communicating with personnel
- completing work using completing work procedures
- determining installation techniques and procedures
- dismantling and assembling components
- identifying and using measuring equipment
- implementing legislation, industry standards, codes of practice and regulations
- interpreting manufacturers' specifications and manuals
- maintaining industrial fans
- planning and preparing for industrial fan maintenance work
- recognising worn or damaged components
- removing industrial fan for maintenance
- replacing and installing industrial fans
- selecting materials and components
- using removal and balancing techniques
- using tools
- utilising permit to work system
- working with maintenance techniques and procedures including coupling, levelling, aligning and working to defined tolerances

Knowledge Evidence

Evidence required to demonstrate competence in this unit must be relevant to and satisfy all the

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requirements of the elements, performance criteria and range of conditions and includes knowledge of:

- defined tolerances
- dismantle and reassemble techniques
- legislation, industry standards, codes of practice and regulations
- maintain industrial fans
- manufacturers' specifications and manuals
- measurement equipment
- permit to work system
- recognition of worn or damaged components
- selection of materials and components
- techniques for coupling, levelling and alignment
- tool use
- WHS/OHS legislated requirements including:
  - emergency procedures
  - hazard identification
  - risk control measures
  - safe working practices
- workplace documentation
- workplace policies and procedures

Assessment Conditions

As a minimum, assessors must satisfy applicable regulatory requirements, which include requirements in the Standards for Registered Training Organisations current at the time of assessment.

As a minimum, assessment must satisfy applicable regulatory requirements, which include requirements in the Standards for Registered Training Organisations current at the time of assessment.

Assessment processes and techniques must be appropriate to the language, literacy and numeracy requirements of the work being performed and the needs of the candidate.

Assessment must occur in workplace operational situations. Where this is not appropriate, assessment must occur in simulated workplace operational situations that reflect workplace conditions.

Resources for assessment must include access to:

- a range of relevant exercises, case studies and/or other simulations
- applicable documentation including workplace procedures, industry standards, equipment specifications, regulations, codes of practice and operation manuals.
- relevant and appropriate materials, tools, equipment and personal protective equipment currently used in industry

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Links

Companion Volume implementation guides are found in VETNet - https://vetnet.gov.au/Pages/TrainingDocs.aspx?q=1715b9fa-e7bd-441c-bb8d-cf22c9c825a8

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UEPMNT307 Maintain industrial screens, strainers and filters

Modification History

Release 1. This is the first release of this unit of competency in the UEP Generation Training Package.

Application

This unit involves the skills and knowledge required to undertake fault finding, diagnosis, repair and/or overhaul of industrial screens, strainers and filters.

Industrial screens, strainers and filters are used in the filtration, separation, extraction and absorption of liquids or solids in a power generation facility's machinery and plant. The diagnosis and repair of faults requires the systematic investigation of any industrial screen, strainer and filter malfunction.

Competency in this unit requires the ability to plan work, remove industrial screens, strainers and filters for maintenance, maintain industrial screens, strainers and filters, replace and/or install industrial screens, strainers and filters and to report on all completed work tasks. Individuals will, in general, work under supervision in an electrical, electronic and/or mechanical equipment repair workshop or on site.

Power generation maintenance personnel are typically trained and authorised to receive permits to work.

No licensing, legislative or certification requirements apply to this unit at the time of publication.

Note: Workplace practice

The application of the skills and knowledge described in this unit of competency may require a licence or training permit to practice in the workplace, where work is carried out on gas and electrical installations. Additional and/or other conditions may apply under state and territory legislative and regulatory licensing requirements.

Pre-requisite Unit

MEM18006C Repair and fit engineering components

MEM09002B Interpret technical drawing

MEM12023A Perform engineering measurements

MEM18001C Use hand tools

MEM18002B Use power tools/hand held operations

MEM18003C Use tools for precision work

MEM18055B Dismantle, replace and assemble engineering components

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Competency Field

Maintenance

Unit Sector

Electricity generation

Elements and Performance Criteria

ELEMENTS	PERFORMANCE CRITERIA
Elements describe the essential outcomes.	Performance criteria describe the performance needed to demonstrate achievement of the element.
1 Plan and prepare for work	**1.1** Requirements including scope of work and assigned roles are identified and confirmed with appropriate personnel or by site inspection, in accordance with workplace procedures
	1.2 Work, Health and Safety (WHS)/Occupational Health and Safety (OHS) regulations, legislative requirements, industry standards, codes of practice, manufacturers' specifications, environmental obligations and workplace procedures are reviewed in preparation for work
	1.3 Resources for work activities are obtained and inspected for compliance with job specification
	1.4 Relevant plans, drawings and manuals are selected and used, in accordance with workplace procedures
	1.5 Correct materials and components for work are obtained and inspected, in accordance with workplace procedures, for compliance with job specification
	1.6 Work is planned, sequenced and prioritised, in accordance with workplace procedures
	1.7 Potential hazards are identified and risk control measures are selected and implemented, in accordance with workplace procedures
	1.8 Work area is prepared, in accordance with workplace procedures
2 Remove screens, strainers and filters for	**2.1** Isolations are confirmed, where appropriate, in

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maintenance		accordance with workplace procedures
	2.2	Screens, strainers and filters are disconnected, in accordance with workplace procedures
	2.3	Screens, strainers and filters are removed, in a manner which will assist in replacement, in accordance with workplace procedures
	2.4	Screens, strainers and filters are inspected for abnormalities, in accordance with workplace procedures
3 Maintain screens, strainers and filters	**3.1**	Equipment isolation and depressurisation is confirmed visually and manually, as required, in accordance with workplace procedures
	3.2	Plant and/or equipment including screen, strainer and filter components, assemblies and/or subassemblies, are identified and prepared for maintenance, in accordance with workplace procedures
	3.3	Equipment, including screens, strainers and filters are removed, cleaned and marked for identification, in accordance with workplace procedures
	3.4	Faulty items are repaired or overhauled, using appropriate principles, techniques and industry standards, in accordance with the workplace procedures
	3.5	Replacement items for installation are selected and inspected, in accordance with manufacturers' specification and workplace procedures
	3.6	Modifications or alterations outside of the manufacturers' specification are approved by appropriate personnel, in accordance with workplace procedures
	3.7	Component failures are identified and probable causes are reported, in accordance with workplace procedures
	3.8	Components or subassemblies are refitted, in accordance with workplace procedures and manufacturers' specification
	3.9	All fastenings are torqued, in accordance with workplace procedures and manufacturers' specification
4 Replace screens, strainers and filters	**4.1**	Equipment and plant is prepared for screens, strainers and filter replacements, in accordance with workplace

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		procedures
	4.2	Screens, strainers and filters are replaced, in accordance with workplace procedures and manufacturers' specification
	4.3	Screens, strainers and filters are levelled, aligned and coupled, in accordance with workplace procedures
	4.4	All fastenings are torqued, in accordance with workplace procedures and manufacturers' specification
	4.5	Equipment and plant including screens, strainers and filters, are given a test run and are monitored and adjusted, as required, in accordance with workplace procedures and manufacturers' specification
5 Complete work	**5.1**	Work is completed and appropriate personnel are notified, in accordance with workplace procedures
	5.2	Work area is cleared of waste, cleaned, restored and secured, in accordance with workplace procedures
	5.3	Tools and equipment are cleaned, maintained and stored, in accordance with workplace procedures
	5.4	Work completion details are finalised, in accordance with workplace procedures

Foundation Skills

Foundation skills essential to performance are explicit in the performance criteria of this unit of competency.

Range of Conditions

Range is restricted to essential operating conditions and any other variables essential to the work environment.

Non-essential conditions may be found in the Companion Volume Implementation Guide.

Unit Mapping Information

This unit replaces and is equivalent to UEPMNT307B Maintain industrial screens, strainers and filters.

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Links

Companion Volume implementation guides are found in VETNet - https://vetnet.gov.au/Pages/TrainingDocs.aspx?q=1715b9fa-e7bd-441c-bb8d-cf22c9c825a8

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Assessment Requirements for UEPMNT307 Maintain industrial screens, strainers and filters

Modification History

Release 1. This is the first release of this unit of competency in the UEP Generation Training Package.

Performance Evidence

Evidence required to demonstrate competence in this unit must be relevant to and satisfy all the requirements of the elements, performance criteria and range of conditions on at least two separate occasions and includes:

- applying Work, Health and Safety (WHS)/Occupational Health and Safety (OHS) requirements including:
  - emergency procedures
  - hazard identification
  - risk control measures
  - safe working practices
- communicating with personnel
- completing work as per scheduled requirements
- dismantling and assembling components
- identifying permit to work system requirements
- interpreting manufacturers' specifications and manuals
- maintaining industrial screens, strainers and filters
- planning for industrial screen, strainer and filter maintenance work
- reading technical drawings and data
- removing industrial screens, strainers and filters for maintenance
- replacing and installing screens, strainers and filters
- using removal, maintenance and installing techniques and procedures
- utilising valve levelling and alignment techniques
- working with measuring equipment and tools

Knowledge Evidence

Evidence required to demonstrate competence in this unit must be relevant to and satisfy all the requirements of the elements, performance criteria and range of conditions and includes knowledge of:

- how to dismantle and assemble components
- installation and maintenance techniques

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- legislation, industry standards, codes of practice and regulations
- levelling and alignment techniques
- maintenance of industrial screens, strainers and filters
- manufacturers' specifications and manuals
- measuring equipment
- permit to work system
- screen and filter types and characteristics
- technical drawings and data use
- tool use
- valve levelling and alignment techniques
- WHS/OHS legislated requirements including:
  - emergency procedures
  - hazard identification
  - risk control measures
  - safe working practices
- workplace documentation
- workplace policies and procedures

Assessment Conditions

As a minimum, assessors must satisfy applicable regulatory requirements, which include requirements in the Standards for Registered Training Organisations current at the time of assessment.

As a minimum, assessment must satisfy applicable regulatory requirements, which include requirements in the Standards for Registered Training Organisations current at the time of assessment.

Assessment processes and techniques must be appropriate to the language, literacy and numeracy requirements of the work being performed and the needs of the candidate.

Assessment must occur in workplace operational situations. Where this is not appropriate, assessment must occur in simulated workplace operational situations that reflect workplace conditions. Resources for assessment must include access to:

- a range of relevant exercises, case studies and/or other simulations
- relevant and appropriate materials, tools, equipment and personal protective equipment currently used in industry
- applicable documentation including workplace procedures, industry standards, equipment specifications, regulations, codes of practice and operation manuals.

Links

Companion Volume implementation guides are found in VETNet - https://vetnet.gov.au/Pages/TrainingDocs.aspx?q=1715b9fa-e7bd-441c-bb8d-cf22c9c825a8

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UEPMNT308 Maintain conveyors and associated equipment

Modification History

Release 1. This is the first release of this unit of competency in the UEP Generation Training Package.

Application

This unit involves the skills and knowledge required to undertake fault finding, diagnosis, adjustments, exchange of rollers and preparations for belt splicing and/or repairs of conveyors and associated equipment.

A conveyor system is a continuous moving band of fabric, rubber or metal used for transporting bulk materials from one place to another in a power generation facility.

Competency in this unit requires the ability to plan work, remove associated equipment to facilitate maintenance, maintain conveyors and/or associated equipment, replace and/or install conveyors and/or associated equipment and to report on all completed work tasks. Individuals will, in general, work under supervision in an electrical, electronic and/or mechanical equipment repair workshop or on site.

Power generation maintenance personnel are typically trained and authorised to receive permits to work.

No licensing, legislative or certification requirements apply to this unit at the time of publication.

Note: Workplace practice

The application of the skills and knowledge described in this unit of competency may require a licence or training permit to practice in the workplace, where work is carried out on gas and electrical installations. Additional and/or other conditions may apply under state and territory legislative and regulatory licensing requirements.

Pre-requisite Unit

MEM18006C Repair and fit engineering components

MEM09002B Interpret technical drawing

MEM12023A Perform engineering measurements

MEM18001C Use hand tools

MEM18002B Use tools for precision work

MEM18055B Dismantle, replace and assemble engineering components

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Competency Field

Maintenance

Unit Sector

Electricity generation

Elements and Performance Criteria

ELEMENTS	PERFORMANCE CRITERIA
Elements describe the essential outcomes.	Performance criteria describe the performance needed to demonstrate achievement of the element.
1 Plan and prepare for work	**1.1** Requirements including scope of work and assigned roles are identified and confirmed with appropriate personnel or by site inspection, in accordance with workplace procedures
	1.2 Work, Health and Safety (WHS)/Occupational Health and Safety (OHS) regulations, legislative requirements, industry standards, codes of practice, manufacturers' specifications, environmental obligations and workplace procedures are reviewed in preparation for work
	1.3 Resources for work activities are obtained and inspected for compliance with job specification
	1.4 Relevant plans, drawings and manuals are selected and used, in accordance with workplace procedures
	1.5 Correct materials and components for work are obtained and inspected, in accordance with workplace procedures, for compliance with job specification
	1.6 Work is planned, sequenced and prioritised, in accordance with workplace procedures
	1.7 Potential hazards are identified, and risk control measures are selected and implemented, in accordance with workplace procedures
	1.8 Work area is prepared, in accordance with workplace procedures
2 Remove associated equipment to facilitate	**2.1** Faulty components and parts of conveyor system are identified and isolations are confirmed, where

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maintenance		appropriate, in accordance with workplace procedures
	2.2	Associated equipment of conveyor system is disconnected, in accordance with the workplace procedures
	2.3	Associated equipment of conveyor system is removed, in a manner which will assist in replacement, in accordance with the workplace procedures
	2.4	Conveyors and associated equipment are inspected for abnormalities, in accordance with workplace procedures
3 Maintain conveyors or associated equipment	**3.1**	Belt tensioning equipment is released and secured, to facilitate maintenance, in accordance with workplace procedures
	3.2	Sketches are made, data is noted and components are marked for identification or reassembly, in accordance with manufacturers' specification and workplace procedures
	3.3	Modifications or alterations outside of manufacturers' specification are approved, in accordance with workplace procedures
	3.4	New components are installed, and inspected for compliance with job specification, and are prepared for reassembly, in accordance with workplace procedures
	3.5	Dimensional inspection is performed, in accordance with workplace procedures, using precision measuring devices to determine compliance
	3.6	Conveyors are levelled, aligned and tensioned, in accordance with workplace procedures and site requirements
4 Replace or install conveyors or associated equipment	**4.1**	Faulty components and parts are identified, and site is prepared for conveyors and associated equipment to be replaced, in accordance with workplace procedures
	4.2	Conveyors and associated equipment are replaced, in accordance with workplace procedures and manufacturers' specification
	4.3	Conveyors and associated equipment are levelled, aligned and coupled, in accordance with workplace procedures

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	4.4	All fastenings are torqued, in accordance with workplace procedures and manufacturers' specifications
	4.5	Conveyors and associated equipment are given a test run, monitored and adjusted, as required, in accordance with workplace procedures and manufacturers' specifications
5 Complete work	**5.1**	Work is completed and appropriate personnel are notified, in accordance with workplace procedures
	5.2	Work area is cleared of waste, cleaned, restored and secured, in accordance with workplace procedures
	5.3	Tools and equipment are cleaned, maintained and stored, in accordance with workplace procedures
	5.4	Work completion details are finalised, in accordance with workplace procedures

Foundation Skills

Foundation skills essential to performance are explicit in the performance criteria of this unit of competency.

Range of Conditions

Range is restricted to essential operating conditions and any other variables essential to the work environment.

Non-essential conditions may be found in the Companion Volume Implementation Guide.

Unit Mapping Information

This unit replaces and is equivalent to UEPMNT308B Maintain conveyors and associated equipment.

Links

Companion Volume implementation guides are found in VETNet - https://vetnet.gov.au/Pages/TrainingDocs.aspx?q=1715b9fa-e7bd-441c-bb8d-cf22c9c825a8

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Assessment Requirements for UEPMNT308 Maintain conveyors and associated equipment

Modification History

Release 1. This is the first release of this unit of competency in the UEP Generation Training Package.

Performance Evidence

Evidence required to demonstrate competence in this unit must be relevant to and satisfy all the requirements of the elements, performance criteria and range of conditions on at least two separate occasions and includes:

- applying Work, Health and Safety (WHS)/Occupational Health and Safety (OHS) requirements including:
  - emergency procedures
  - hazard identification
  - risk control measures
  - safe working practices
- communicating with personnel
- completing work as per schedule requirements
- dismantling, exchanging and reassembling components and parts
- identifying and using measuring equipment
- interpreting manufacturers' specifications and manuals
- maintaining conveyors or associated equipment
- performing removal, maintenance, installing, valve levelling and alignment techniques and procedures
- planning for conveyor and associated equipment maintenance work
- removing conveyors and associated equipment to facilitate maintenance
- replacing and installing conveyors or associated equipment
- tracking, aligning and tensioning conveyors and associated equipment
- using tools
- working with permit to work system

Knowledge Evidence

Evidence required to demonstrate competence in this unit must be relevant to and satisfy all the requirements of the elements, performance criteria and range of conditions and includes knowledge of:

- dismantle, exchange and reassembly of components and parts
- identification and use of measuring equipment

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- interpretation of technical drawings, manufacturers' specifications and manuals
- isolations
- legislation, industry standards, codes of practice and regulations
- level and alignment techniques
- maintenance of conveyors and associated equipment valve levelling and alignment techniques
- manufacturers' specifications and manuals
- permit to work system
- tool use
- track, align and tension conveyors and associated equipment
- WHS/OHS legislated requirements including:
  - emergency procedures
  - hazard identification
  - risk control measures
  - safe working practices
- workplace documentation
- workplace policies and procedures

Assessment Conditions

As a minimum, assessors must satisfy applicable regulatory requirements, which include requirements in the Standards for Registered Training Organisations current at the time of assessment.

As a minimum, assessment must satisfy applicable regulatory requirements, which include requirements in the Standards for Registered Training Organisations current at the time of assessment.

Assessment processes and techniques must be appropriate to the language, literacy and numeracy requirements of the work being performed and the needs of the candidate.

Assessment must occur in workplace operational situations. Where this is not appropriate, assessment must occur in simulated workplace operational situations that reflect workplace conditions.

Resources for assessment must include access to:

- a range of relevant exercises, case studies and/or other simulations
- relevant and appropriate materials, tools, equipment and personal protective equipment currently used in industry
- applicable documentation including workplace procedures, industry standards, equipment specifications, regulations, codes of practice and operation manuals.

Links

Companion Volume implementation guides are found in VETNet - https://vetnet.gov.au/Pages/TrainingDocs.aspx?q=1715b9fa-e7bd-441c-bb8d-cf22c9c825a8

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UEPMNT309 Maintain material feeders

Modification History

Release 1. This is the first release of this unit of competency in the UEP Generation Training Package.

Application

This unit involves the skills and knowledge required to undertake fault finding, diagnosis, out of service inspection (internal or external), repairs and/or overhaul of material feeders.

Material feeders are used to regulate the flow of bulk materials from bins and hoppers. They can be used in conjunction with other types of material handling equipment such as conveyors in a power generation facility.

Competency in this unit requires the ability to plan work, conduct in-service testing, remove equipment to facilitate maintenance of material feeders, maintain material feeders, replace or install material feeders and to report on all completed work tasks. Individuals will, in general, work under supervision in an electrical, electronic and/or mechanical equipment repair workshop or on site.

Power generation maintenance personnel are typically trained and authorised to receive permits to work.

No licensing, legislative or certification requirements apply to this unit at the time of publication.

Note: Workplace practice

The application of the skills and knowledge described in this unit of competency may require a licence or training permit to practice in the workplace, where work is carried out on gas and electrical installations. Additional and/or other conditions may apply under state and territory legislative and regulatory licensing requirements.

Pre-requisite Unit

MEM18006C Repair and fit engineering components

MEM09002B Interpret technical drawing

MEM12023A Perform engineering measurements

MEM18001C Use hand tools

MEM18002B Use power tools/hand held operations

MEM18003C Use tools for precision work

MEM18055B Dismantle, replace and assemble engineering components

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Competency Field

Maintenance

Unit Sector

Electricity generation

Elements and Performance Criteria

ELEMENTS	PERFORMANCE CRITERIA
Elements describe the essential outcomes.	Performance criteria describe the performance needed to demonstrate achievement of the element.
1 Plan and prepare for work	**1.1** Requirements including scope of work and assigned roles are identified and confirmed with appropriate personnel or by site inspection, in accordance with workplace procedures
	1.2 Work, Health and Safety (WHS)/Occupational Health and Safety (OHS) regulations, legislative requirements, industry standards, codes of practice, manufacturers' specifications, environmental obligations and workplace procedures are reviewed in preparation for work
	1.3 Resources are obtained and inspected for compliance with job specification
	1.4 Relevant plans, drawings and manuals are selected and used, in accordance with workplace procedures
	1.5 Correct materials and components for work are obtained and inspected, in accordance with workplace procedures, for compliance with job specification
	1.6 Work is planned, sequenced and prioritised, in accordance with workplace procedures
	1.7 Potential hazards are identified and risk control measures are selected and implemented, in accordance with workplace procedures
	1.8 Work area is prepared, in accordance with workplace procedures
2 Conduct in-service testing	**2.1** In-service tests are carried out, in accordance with

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		workplace procedures
	2.2	Faults are located using appropriate tools, equipment and testing techniques, in accordance with workplace procedures
	2.3	Testing and fault finding results are analysed, in accordance with workplace procedures, to establish repairs required or serviceability of material feeder
3 Remove equipment to facilitate maintenance	**3.1**	Isolations are confirmed, where appropriate, in accordance with workplace procedures
	3.2	Material feeders are disconnected, in accordance with the workplace procedures
	3.3	Material feeders are removed, in a manner which will assist in replacement, in accordance with workplace procedures
	3.4	Material feeders are inspected for abnormalities, in accordance with workplace procedures
4 Maintain material feeders	**4.1**	Maintenance is performed on material feeder, in accordance with workplace procedures and manufacturers' specification
	4.2	Components or subassemblies are dismantled, cleaned and examined, in accordance with workplace procedures, to verify tolerances and to determine whether to replace, overhaul or repair
	4.3	Material feeder equipment is dismantled, in a manner that will facilitate reassembly, in accordance with workplace procedures
	4.4	Component parts are clearly marked for identification, in accordance with workplace procedures
	4.5	Components are laid out, in preparation for reassembly, in accordance with workplace procedures and manufacturers' drawings or specifications
	4.6	New components are inspected for compliance with manufacturers' specification and are prepared for assembly, in accordance with workplace procedures
	4.7	Modifications or alterations are undertaken, in accordance with workplace procedures

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	4.8	Components are reassembled, in accordance with workplace procedures
5 Replace or install material feeders	**5.1**	Equipment is prepared for material feeders to be replaced, in accordance with workplace procedures
	5.2	All fastenings are torqued, in accordance with workplace procedures and manufacturers' specifications
	5.3	Material feeders are given a test run and are monitored, as required, in accordance with workplace procedures and manufacturers' specification
6 Complete work	**6.1**	Work is completed and appropriate personnel are notified, in accordance with workplace procedures
	6.2	Work area is cleared of waste, cleaned, restored and secured, in accordance with workplace procedures
	6.3	Tools and equipment are cleaned, maintained and stored, in accordance with workplace procedures
	6.4	Work completion details are finalised, in accordance with workplace procedures

Foundation Skills

Foundation skills essential to performance are explicit in the performance criteria of this unit of competency.

Range of Conditions

Range is restricted to essential operating conditions and any other variables essential to the work environment.

Non-essential conditions may be found in the Companion Volume Implementation Guide.

Unit Mapping Information

This unit replaces and is equivalent to UEPMNT309B Maintain material feeders.

Links

Companion Volume implementation guides are found in VETNet - https://vetnet.gov.au/Pages/TrainingDocs.aspx?q=1715b9fa-e7bd-441c-bb8d-cf22c9c825a8

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Assessment Requirements for UEPMNT309 Maintain material feeders

Modification History

Release 1. This is the first release of this unit of competency in the UEP Generation Training Package.

Performance Evidence

Evidence required to demonstrate competence in this unit must be relevant to and satisfy all the requirements of the elements, performance criteria and range of conditions on at least two separate occasions and includes:

- applying Work, Health and Safety (WHS)/Occupational Health and Safety (OHS) requirements including:
  - emergency procedures
  - hazard identification
  - risk control measures
  - safe working practices
- communicating with personnel
- completing work as per schedule requirements
- conducting material feeder in-service testing using in-servicing testing procedures
- dismantling and reassembling components
- identifying and selecting resources, materials and components
- interpreting manufacturers' specifications and manuals
- interpreting technical drawings and data
- maintaining material feeders using maintenance techniques and procedures including levelling and alignment techniques and adjustments for desired material feed rate replacing and installing material feeders using removal or installation techniques and procedures
- planning for material feeder maintenance work
- removing equipment to facilitate maintenance using removal techniques
- using tools
- utilising data analysis techniques
- working with permit to work system

Knowledge Evidence

Evidence required to demonstrate competence in this unit must be relevant to and satisfy all the requirements of the elements, performance criteria and range of conditions and includes knowledge of:

- adjustments for desired material feed rate

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- component dismantling and reassembling
- data analysis techniques
- feeder types and operating characteristics
- legislation, industry standards, codes of practice and regulations
- level and alignment techniques
- maintenance of material feeders
- manufacturers' specifications
- materials and components
- permit to work system
- technical drawings and data
- tools
- typical arrangements of power production plant
- WHS/OHS legislated requirements including:
  - emergency procedures
  - hazard identification
  - risk control measures
  - safe working practices
- workplace documentation
- workplace policies and procedures

Assessment Conditions

As a minimum, assessors must satisfy applicable regulatory requirements, which include requirements in the Standards for Registered Training Organisations current at the time of assessment.

As a minimum, assessment must satisfy applicable regulatory requirements, which include requirements in the Standards for Registered Training Organisations current at the time of assessment.

Assessment processes and techniques must be appropriate to the language, literacy and numeracy requirements of the work being performed and the needs of the candidate.

Assessment must occur in workplace operational situations. Where this is not appropriate, assessment must occur in simulated workplace operational situations that reflect workplace conditions. Resources for assessment must include access to:

- a range of relevant exercises, case studies and/or other simulations
- relevant and appropriate materials, tools, equipment and personal protective equipment currently used in industry
- applicable documentation including workplace procedures, industry standards, equipment specifications, regulations, codes of practice and operation manuals.

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Companion Volume implementation guides are found in VETNet - https://vetnet.gov.au/Pages/TrainingDocs.aspx?q=1715b9fa-e7bd-441c-bb8d-cf22c9c825a8

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UEPMNT310 Maintain material crushers

Modification History

Release 1. This is the first release of this unit of competency in the UEP Generation Training Package.

Application

This unit involves the skills and knowledge required to undertake in-servicing, fault finding, diagnosis, out of service inspection, repair or overhaul of material crushers including roll and/or door assemblies.

Material crushers are used to reduce solid materials, they operate by using components such as balls, jaws or rollers that move or turn together with great force.

Competency in this unit requires the ability to plan work, conduct in-service testing of material crushers, remove material crusher's equipment to facilitate maintenance, maintain material crushers, replace and/or install material crushers and to report on all completed work tasks. Individuals will, in general, work under supervision in an electrical, electronic and/or mechanical equipment repair workshop or on site.

Power generation maintenance personnel are typically trained and authorised to receive permits to work.

No licensing, legislative or certification requirements apply to this unit at the time of publication.

Note: Workplace practice

The application of the skills and knowledge described in this unit of competency may require a licence or training permit to practice in the workplace, where work is carried out on gas and electrical installations. Additional and/or other conditions may apply under state and territory legislative and regulatory licensing requirements.

Pre-requisite Unit

MEM18006C Repair and fit engineering components

MEM09002B Interpret technical drawing

MEM12023A Perform engineering measurements

MEM18001C Use hand tools

MEM18002B Use power tools/hand held operations

MEM18003C Use tools for precision work

MEM18055B Dismantle, replace and assemble engineering components

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Competency Field

Maintenance

Unit Sector

Electricity generation

Elements and Performance Criteria

ELEMENTS	PERFORMANCE CRITERIA
Elements describe the essential outcomes.	Performance criteria describe the performance needed to demonstrate achievement of the element.
1 Plan and prepare for work	**1.1** Requirements including scope of work and assigned roles are identified and confirmed with appropriate personnel or by site inspection, in accordance with workplace procedures
	1.2 Work, Health and Safety (WHS)/Occupational Health and Safety (OHS) regulations, legislative requirements, industry standards, codes of practice, manufacturers' specifications, environmental obligations and workplace procedures are reviewed in preparation for work
	1.3 Resources are obtained and inspected for compliance with job specification
	1.4 Relevant plans, drawings and manuals are selected and used, in accordance with workplace procedures
	1.5 Correct materials and components for work are obtained and inspected, in accordance with workplace procedures, for compliance with job specification
	1.6 Work is planned, sequenced and prioritised, in accordance with workplace procedures
	1.7 Potential hazards are identified and risk control measures are selected and implemented, in accordance with the workplace procedures
	1.8 Work area is prepared, in accordance with workplace procedures
2 Conduct in-service testing	**2.1** In-service tests are carried out, in accordance with

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		workplace procedures
	2.2	Faults are located, in accordance with workplace procedures, using appropriate tools, equipment and testing techniques
	2.3	Testing and fault finding results are analysed, in accordance with workplace procedures, to establish repairs or ascertain serviceability of material crusher
3 Remove equipment to facilitate maintenance	**3.1**	Isolations are confirmed, where appropriate, in accordance with workplace procedures and site requirements
	3.2	Material crushers are disconnected, in accordance with workplace procedures
	3.3	Material crusher components are removed, in a manner which will assist in replacement, in accordance with workplace procedures
	3.4	Material crusher components are inspected for abnormalities, in accordance with workplace procedures
4 Maintain material crushers	**4.1**	Components or subassemblies are dismantled, cleaned and examined to verify tolerances, in accordance with workplace procedures, to determine need to replace, overhaul or repair material crusher
	4.2	Sketches are made, data noted and components are marked for identification for reassembly or overhaul, in accordance with workplace procedures
	4.3	Dimensional inspection is performed, in accordance with workplace procedures, using precision measuring devices to determine compliance with relevant drawings and/or manufacturers' specification
	4.4	New components are inspected for compliance with manufacturers' specification and are prepared for assembly, in accordance with workplace procedures
	4.5	Components are weighed, measured and recorded, in accordance with workplace procedures and site requirements
	4.6	Components are reassembled and preliminary balance of equipment is obtained, maintained and adjusted by assembling components sequentially by appropriate

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		weight, in accordance with workplace procedures
	4.7	Plant and machinery is adjusted using appropriate techniques, in accordance with workplace procedures, manufacturers' specification and site tolerances
	4.8	All fastenings are torqued, in accordance with workplace procedures and manufacturers' specifications
	4.9	Components are levelled and aligned, using appropriate tools, in accordance with workplace procedures
5 Replace/install material crushers	**5.1**	Equipment is prepared for material crushers to be replaced, in accordance with workplace procedures
	5.2	Material crushers are replaced, in accordance with workplace procedures and manufacturers' specification
	5.3	Alterations or corrections are undertaken, in accordance with workplace procedures
	5.4	Material crushers are levelled, aligned and coupled, in accordance with workplace procedures
	5.5	All fastenings are torqued, in accordance with workplace procedures, manufacturers' specification and site requirements
	5.6	Material crushers are given a test run and are monitored, as required, in accordance with workplace procedures and manufacturers' specification
6 Complete work	**6.1**	Work is completed and appropriate personnel are notified, in accordance with workplace procedures
	6.2	Work area is cleared of waste, cleaned, restored and secured, in accordance with workplace procedures
	6.3	Tools and equipment are cleaned, maintained and stored, in accordance with workplace procedures
	6.4	Work completion details are finalised, in accordance with workplace procedures

Foundation Skills

Foundation skills essential to performance are explicit in the performance criteria of this unit of competency.

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Range of Conditions

Range is restricted to essential operating conditions and any other variables essential to the work environment.

Non-essential conditions may be found in the Companion Volume Implementation Guide.

Unit Mapping Information

This unit replaces and is equivalent to UEPMNT310B Maintain material crushers.

Links

Companion Volume implementation guides are found in VETNet - https://vetnet.gov.au/Pages/TrainingDocs.aspx?q=1715b9fa-e7bd-441c-bb8d-cf22c9c825a8

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Assessment Requirements for UEPMNT310 Maintain material crushers

Modification History

Release 1. This is the first release of this unit of competency in the UEP Generation Training Package.

Performance Evidence

Evidence required to demonstrate competence in this unit must be relevant to and satisfy all the requirements of the elements, performance criteria and range of conditions on at least two separate occasions and includes:

- applying Work, Health and Safety (WHS)/Occupational Health and Safety (OHS) requirements including:
  - emergency procedures
  - hazard identification
  - risk control measures
  - safe working practices
- communicating with personnel
- completing work as per scheduled arrangements
- conducting material crusher in-service testing using in-service testing procedures to identify faults
- determining measuring equipment
- dismantling and reassembling components
- interpreting technical drawings, manufacturers' specifications and manuals
- maintaining material crushers using maintenance techniques and procedures
- planning for material crusher maintenance work
- removing equipment to facilitate material crusher maintenance using removal techniques
- replacing and installing material crushers using removal and installation techniques and procedures
- selecting materials and components
- testing, adjusting, replacing and overhauling crushers for desired material sizing
- using tools including specialised tools and jigs
- utilising levelling and alignment techniques
- working with permit to work system

Knowledge Evidence

Evidence required to demonstrate competence in this unit must be relevant to and satisfy all the requirements of the elements, performance criteria and range of conditions and includes

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knowledge of:

- component dismantling and reassembly
- crusher types and operating characteristics
- identification and use of measuring equipment
- legislation, industry standards, codes of practice and regulations
- maintenance of material crushers
- manufacturers' specifications and manuals
- materials and components
- permit to work system
- technical drawings
- tests, adjustments, replacements and overhaul requirements material crushers
- tolerances
- tools including specialised tools and jigs
- typical arrangements of power production plant
- WHS/OHS legislated requirements including:
  - emergency procedures
  - hazard identification
  - risk control measures
  - safe working practices
- workplace documentation
- workplace policies and procedures

Assessment Conditions

As a minimum, assessors must satisfy applicable regulatory requirements, which include requirements in the Standards for Registered Training Organisations current at the time of assessment.

As a minimum, assessment must satisfy applicable regulatory requirements, which include requirements in the Standards for Registered Training Organisations current at the time of assessment.

Assessment processes and techniques must be appropriate to the language, literacy and numeracy requirements of the work being performed and the needs of the candidate.

Assessment must occur in workplace operational situations. Where this is not appropriate, assessment must occur in simulated workplace operational situations that reflect workplace conditions. Resources for assessment must include access to:

- a range of relevant exercises, case studies and/or other simulations
- relevant and appropriate materials, tools, equipment and personal protective equipment currently used in industry
- applicable documentation including workplace procedures, industry standards, equipment specifications, regulations, codes of practice and operation manuals.

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Links

Companion Volume implementation guides are found in VETNet - https://vetnet.gov.au/Pages/TrainingDocs.aspx?q=1715b9fa-e7bd-441c-bb8d-cf22c9c825a8

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UEPMNT312 Maintain industrial pressure vessels

Modification History

Release 1. This is the first release of this unit of competency in the UEP Generation Training Package.

Application

This unit involves the skills and knowledge required to maintain boiler pressure parts, pressure vessels and associated components.

Pressure vessels are designed to hold gas or liquids at a pressure substantially different from the ambient pressure, they are used in conjunction with mechanical plant and equipment in a power generation facility. Maintaining boiler pressure parts, pressure vessels and associated components will include monitoring and verifying equipment is operating efficiently.

Competency in this unit requires the ability to plan work, remove associated equipment to facilitate maintenance, dismantle and maintain pressure vessel, reassemble pressure vessel and to report on all completed work tasks. Individuals will, in general, work under supervision in an electrical, electronic and/or mechanical equipment repair workshop or on site.

Power generation maintenance personnel are typically trained and authorised to receive permits to work.

No licensing, legislative or certification requirements apply to this unit at the time of publication.

Note: Workplace practice

The application of the skills and knowledge described in this unit of competency may require a licence or training permit to practice in the workplace, where work is carried out on gas and electrical installations. Additional and/or other conditions may apply under state and territory legislative and regulatory licensing requirements.

Pre-requisite Unit

MEM18006C Repair and fit engineering components

MEM09002B Interpret technical drawing

MEM12023A Perform engineering measurements

MEM18001C Use hand tools

MEM18002B Use power tools/hand held operations

MEM18003C Use tools for precision work

MEM18055B Dismantle, replace and assemble engineering components

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Competency Field

Maintenance

Unit Sector

Electricity generation

Elements and Performance Criteria

ELEMENTS	PERFORMANCE CRITERIA
Elements describe the essential outcomes.	Performance criteria describe the performance needed to demonstrate achievement of the element.
1 Plan and prepare for work	**1.1** Requirements including scope of work and assigned roles are identified and confirmed with appropriate personnel or by site inspection, in accordance with workplace procedures
	1.2 Work, Health and Safety (WHS)/Occupational Health and Safety (OHS) regulations, legislative requirements, industry standards, codes of practice, manufacturers' specifications, environmental obligations and workplace procedures are reviewed in preparation for work
	1.3 Resources are obtained and inspected for compliance with job specification
	1.4 Relevant plans, drawings and manuals are selected and used, in accordance with workplace procedures
	1.5 Correct materials and components for work are obtained and inspected, in accordance with workplace procedures, for compliance with job specification
	1.6 Work is planned sequenced, prioritised, in accordance with workplace procedures
	1.7 Potential hazards are identified and risk control measures are selected and implemented, in accordance with workplace procedures
	1.8 Work area is prepared, in accordance with workplace procedures
2 Remove associated equipment to facilitate	**2.1** Associated equipment isolation and depressurisation is confirmed visually and manually, as required, in

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maintenance		accordance with workplace procedures
	2.2	Pressure vessel is disconnected, in accordance with the workplace procedures
	2.3	Pressure vessel's associated equipment is removed, in a manner which will assist in replacement, in accordance with workplace procedures
	2.4	Pressure vessel is inspected for abnormalities, in accordance with workplace procedures
3 Dismantle and maintain pressure vessel	**3.1**	Hazardous material is identified and arrangements are made for clearance from pressure vessel and work site, in accordance with workplace procedures and legislative requirements
	3.2	Internal and external components are systematically dismantled, marked and recorded, in accordance with workplace procedures
	3.3	Components are refurbished, catalogued and stored for reassembly, in accordance with workplace procedures and manufacturers' specifications
	3.4	Gasket and seal requirements are assessed, manufactured or obtained, in accordance with workplace procedures and manufacturers' specifications
	3.5	Vessel mountings are maintained, as required, in accordance with workplace procedures and manufacturers' specifications
	3.6	Internal piping or tubing is tested and expanded or replaced, as required, in accordance with workplace procedures and manufacturers' specifications
4 Reassemble pressure vessel	**4.1**	Internal and external components are systematically reassembled, in accordance with workplace procedures and manufacturers' specifications
	4.2	Associated equipment is aligned and replaced, in accordance with workplace procedures
	4.3	Fastenings are torqued, in accordance with manufactures' specification and workplace procedures
	4.4	Vessel is pressure tested, monitored and adjusted, if required, in accordance with workplace procedures, and

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		legislative requirements
5	**Complete work**	**5.1** Work is completed and appropriate personnel are notified, in accordance with workplace procedures
		5.2 Work area is cleared of waste, cleaned, restored and secured, in accordance with workplace procedures
		5.3 Tools and equipment are cleaned, maintained and stored, in accordance with workplace procedures
		5.4 Work completion details are finalised, in accordance with workplace procedures

Foundation Skills

Foundation skills essential to performance are explicit in the performance criteria of this unit of competency.

Range of Conditions

Range is restricted to essential operating conditions and any other variables essential to the work environment.

Non-essential conditions may be found in the Companion Volume Implementation Guide.

Unit Mapping Information

This unit replaces and is equivalent to UEPMNT312B Maintain industrial pressure vessels.

Links

Companion Volume implementation guides are found in VETNet - https://vetnet.gov.au/Pages/TrainingDocs.aspx?q=1715b9fa-e7bd-441c-bb8d-cf22c9c825a8

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Assessment Requirements for UEPMNT312 Maintain industrial pressure vessels

Modification History

Release 1. This is the first release of this unit of competency in the UEP Generation Training Package.

Performance Evidence

Evidence required to demonstrate competence in this unit must be relevant to and satisfy all the requirements of the elements, performance criteria and range of conditions on at least two separate occasions and includes:

- applying Work, Health and Safety (WHS)/Occupational Health and Safety (OHS) requirements including:
    - emergency procedures
    - hazard identification
    - risk control measures
    - safe working practices
- communicating with personnel
- completing work as per schedules
- dismantling and reassembling components
- identifying, repairing and installing pressure system components
- interpreting manufacturers' specifications and manuals
- manufacturing and installing gaskets and seals
- operating in permit to work system
- planning for industrial pressure vessel maintenance work
- reassembling industrial pressure vessel
- removing associated equipment to facilitate maintenance using removal techniques dismantling and maintaining industrial pressure vessel utilising maintenance techniques and procedures
- using tools including specialised tools and jigs
- utilising installation, testing, levelling and alignment techniques
- working on pressure vessels, valves and mountings

Knowledge Evidence

Evidence required to demonstrate competence in this unit must be relevant to and satisfy all the requirements of the elements, performance criteria and range of conditions and includes knowledge of:

- component dismantling and reassembly

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- industrial pressure vessels
- legislation, industry standards, codes of practice and regulations
- levelling and alignment techniques
- manufacture and installation of gaskets and seals
- manufacturers' specifications and manuals
- materials and components
- permit to work system
- pressure system characteristics
- repair and installation of pressure system components
- technical drawings
- tools including specialised tools and jigs
- typical arrangements of power production plant
- valves and mountings
- valves and pressure system components
- WHS/OHS legislated requirements including:
  - emergency procedures
  - hazard identification
  - risk control measures
  - safe working practices
- workplace documentation
- workplace policies and procedures

Assessment Conditions

As a minimum, assessors must satisfy applicable regulatory requirements, which include requirements in the Standards for Registered Training Organisations current at the time of assessment.

As a minimum, assessment must satisfy applicable regulatory requirements, which include requirements in the Standards for Registered Training Organisations current at the time of assessment.

Assessment processes and techniques must be appropriate to the language, literacy and numeracy requirements of the work being performed and the needs of the candidate.

Assessment must occur in workplace operational situations. Where this is not appropriate, assessment must occur in simulated workplace operational situations that reflect workplace conditions. Resources for assessment must include access to:

- a range of relevant exercises, case studies and/or other simulations
- relevant and appropriate materials, tools, equipment and personal protective equipment currently used in industry
- applicable documentation including workplace procedures, industry standards, equipment specifications, regulations, codes of practice and operation manuals.

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Links

Companion Volume implementation guides are found in VETNet - https://vetnet.gov.au/Pages/TrainingDocs.aspx?q=1715b9fa-e7bd-441c-bb8d-cf22c9c825a8

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UEPMNT314 Maintain hydro turbines

Modification History

Release 1. This is the first release of this unit of competency in the UEP Generation Training Package.

Application

This unit involves the skills and knowledge required to maintain hydro turbines including their removal from service and the completion of overhauls.

An overhaul includes a thorough examination of the hydro turbine, with repairs or changes made, if required. This may mean taking apart the hydro turbine to examine and repair it.

Competency in this unit requires the ability to plan work, disassemble a hydro turbine, inspect a hydro turbine's components, repair a hydro turbine and/or its' components and to report on all completed work tasks. Individuals will, in general, work under supervision in an electrical, electronic and/or mechanical equipment repair workshop or onsite.

Power generation maintenance personnel are typically trained and authorised to receive permits to work.

No licensing, legislative or certification requirements apply to this unit at the time of publication.

Note: Workplace practice

The application of the skills and knowledge described in this unit of competency may require a licence or training permit to practice in the workplace, where work is carried out on gas and electrical installations. Additional and/or other conditions may apply under state and territory legislative and regulatory licensing requirements.

Pre-requisite Unit

There are no prerequisite units.

Competency Field

Maintenance

Unit Sector

Electricity generation

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Elements and Performance Criteria

ELEMENTS	PERFORMANCE CRITERIA
Elements describe the essential outcomes.	Performance criteria describe the performance needed to demonstrate achievement of the element.
1 Plan and prepare for work	**1.1** Requirements including scope of work and assigned roles are identified and confirmed with appropriate personnel or by site inspection, in accordance with workplace procedures
	1.2 Work, Health and Safety (WHS)/Occupational Health and Safety (OHS) regulations, legislative requirements, industry standards, codes of practice, manufacturers' specifications, environmental obligations and workplace procedures are reviewed in preparation for work
	1.3 Resources are obtained and inspected for compliance with job specifications
	1.4 Relevant plans, drawings and manuals are selected and interpreted, in accordance with workplace procedures
	1.5 Correct materials and components for work are obtained and inspected, in accordance with workplace procedures, for compliance with job specifications
	1.6 Work is planned, sequenced and prioritised, in accordance with workplace procedures
	1.7 Potential hazards are identified, and risk control measures are selected and implemented, in accordance with workplace procedures
	1.8 Work area is prepared, in accordance with workplace procedures
2 Disassemble hydro turbine	**2.1** Isolations are confirmed, where appropriate, in accordance with workplace procedures
	2.2 Hydro turbine is disassembled, in accordance with workplace procedures and manufacturers' specifications
	2.3 Hydro turbine components are removed in order of priority, in accordance with workplace procedures and manufacturers' specifications
	2.4 Disassembly is carried out to facilitate reassembly, in

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		accordance with workplace procedures
	2.5	Components are measured, and clearances are taken, to determine conformity to manufacturers' limits, and to ensure assembly is in accordance with manufacturers' specifications
	2.6	Measurements and clearances are recorded, in accordance with workplace procedures and manufacturers' specifications
3 Inspect hydro turbine components	**3.1**	Components are cleaned and inspected, in accordance with workplace procedures
	3.2	Faults are identified and recorded, in accordance with workplace procedures
	3.3	New components are inspected for compliance to manufacturers' specifications and hydro turbine requirements
	3.4	Components are prepared for assembly, in accordance with workplace procedures
4 Repair hydro turbine and components	**4.1**	Repairs are carried out, in accordance with workplace procedures
	4.2	Repairs are tested, and results analysed, to ensure conformance to manufacturers' specifications, in accordance with workplace procedures
	4.3	Data from testing is recorded, in accordance with workplace procedures
5 Complete work	**5.1**	Work is completed, and appropriate personnel are notified, in accordance with workplace procedures
	5.2	Work area is cleared of waste, cleaned, restored and secured, in accordance with workplace procedures
	5.3	Tools and equipment are cleaned, maintained and stored, in accordance with workplace procedures
	5.4	Work completion details are finalised, in accordance with workplace procedures

Foundation Skills

Foundation skills essential to performance are explicit in the performance criteria of this unit of

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competency.

Range of Conditions

Range is restricted to essential operating conditions and any other variables essential to the work environment.

Non-essential conditions may be found in the Companion Volume Implementation Guide.

Unit Mapping Information

This unit replaces and is equivalent to UEPMNT314B Maintain hydro turbines.

Links

Companion Volume implementation guides are found in VETNet - https://vetnet.gov.au/Pages/TrainingDocs.aspx?q=1715b9fa-e7bd-441c-bb8d-cf22c9c825a8

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Assessment Requirements for UEPMNT314 Maintain hydro turbines

Modification History

Release 1. This is the first release of this unit of competency in the UEP Generation Training Package.

Performance Evidence

Evidence required to demonstrate competence in this unit must be relevant to and satisfy all the requirements of the elements, performance criteria and range of conditions on at least two separate occasions and includes:

- applying Work, Health and Safety (WHS)/Occupational Health and Safety (OHS) requirements including:
  - emergency procedures
  - identifying hazardous materials
  - safe working practices
  - using risk control measures
- communicating with personnel
- completing work as per scheduling requirements
- determining permit to work requirements
- diagnosing and testing hydro turbines and components
- disassembling a hydro turbine using utilising removal techniques and procedures inspecting hydro turbine components including selecting and using components
- interpreting manufacturers' specifications and manuals
- maintaining hydro turbines using overhaul, maintenance and replacement techniques and procedures
- planning for hydro turbine maintenance work
- recognising worn, damaged or faulty components
- repairing hydro turbines and components
- using precision measuring equipment
- working with tools

Knowledge Evidence

Evidence required to demonstrate competence in this unit must be relevant to and satisfy all the requirements of the elements, performance criteria and range of conditions and includes knowledge of:

- data recording techniques
- diagnostic and testing techniques

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- hydro turbines supporting equipment
- hydro turbines types and characteristics
- isolations
- legislation, industry standards, codes of practice and regulations
- maintenance of hydro turbines
- manufacturers' specifications and manuals
- permit to work system
- power generation plant and equipment and its location
- precision measuring equipment
- tools
- typical arrangements of hydro power production plant
- WHS/OHS legislated requirements including:
  - emergency procedures
  - identifying hazardous materials
  - safe working practices
  - using risk control measures
- workplace documentation
- workplace policies and procedures

Assessment Conditions

As a minimum, assessors must satisfy applicable regulatory requirements, which include requirements in the Standards for Registered Training Organisations current at the time of assessment.

As a minimum, assessment must satisfy applicable regulatory requirements, which include requirements in the Standards for Registered Training Organisations current at the time of assessment.

Assessment processes and techniques must be appropriate to the language, literacy and numeracy requirements of the work being performed and the needs of the candidate.

Assessment must occur in workplace operational situations. Where this is not appropriate, assessment must occur in simulated workplace operational situations that reflect workplace conditions. Resources for assessment must include access to:

- a range of relevant exercises, case studies and/or other simulations
- relevant and appropriate materials, tools, equipment and personal protective equipment currently used in industry
- applicable documentation including workplace procedures, industry standards, equipment specifications, regulations, codes of practice and operation manuals.

Links

Companion Volume implementation guides are found in VETNet - https://vetnet.gov.au/Pages/TrainingDocs.aspx?q=1715b9fa-e7bd-441c-bb8d-cf22c9c825a8

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UEPMNT317 Diagnose and repair faults in mechanical equipment

Modification History

Release 1. This is the first release of this unit of competency in the UEP Generation Training Package.

Application

This unit involves the skills and knowledge required to diagnose and repair faults in a range of mechanical equipment; this may entail work to be carried out whilst machinery or power generation plant is online.

Diagnosing and repairing faults in mechanical equipment includes locating faults, overhauling equipment and/or fitting and adjusting mechanical equipment to meet power generation facility requirements.

Competency in this unit requires the ability to plan work, verify mechanical equipment faults, find mechanical equipment faults, determine the cause of mechanical equipment faults, repair or rectify mechanical equipment faults and to report on all completed work tasks. Individuals will, in general, work under supervision in an electrical, electronic, and/or mechanical equipment repair workshop or on site.

Power generation maintenance personnel are typically trained and authorised to receive permits to work.

No licensing, legislative or certification requirements apply to this unit at the time of publication.

Note: Workplace practice

The application of the skills and knowledge described in this unit of competency may require a licence or training permit to practice in the workplace, where work is carried out on gas and electrical installations. Additional and/or other conditions may apply under state and territory legislative and regulatory licensing requirements.

Pre-requisite Unit

MEM18006C Repair and fit engineering components

MEM09002B Interpret technical drawing

MEM12023A Perform engineering measurements

MEM18001C Use hand tools

MEM18002B Use power tools/hand held operations

MEM18003C Use tools for precision work

MEM18055B Dismantle, replace and assemble engineering components

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Competency Field

Maintenance

Unit Sector

Electricity generation

Elements and Performance Criteria

ELEMENTS	PERFORMANCE CRITERIA
Elements describe the essential outcomes.	Performance criteria describe the performance needed to demonstrate achievement of the element.
1 Plan and prepare for work	**1.1** Requirements including scope of work and assigned roles are identified and confirmed with appropriate personnel or by site inspection, in accordance with workplace procedures
	1.2 Work, Health and Safety (WHS)/Occupational Health and Safety (OHS) regulations, legislative requirements, industry standards, codes of practice, manufacturers' specifications, environmental obligations and workplace procedures are reviewed in preparation for work
	1.3 Resources are obtained and inspected for compliance with workplace procedures
	1.4 Relevant plans, drawings and manuals are selected and used, in accordance with workplace procedures
	1.5 Correct materials and components for work are obtained and inspected, in accordance with workplace procedures, for compliance with job specifications
	1.6 Work is planned, sequenced and prioritised, in accordance with workplace procedures
	1.7 Potential hazards are identified and risk control measures are selected, in accordance with workplace procedures
	1.8 Work area is prepared, in accordance with workplace procedures
2 Verify fault	**2.1** Normal performance and function of mechanical equipment is ascertained by consulting manufacturers'

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		specifications and manuals, in accordance with workplace procedures
	2.2	Fault indicators, technical information and diagnostic techniques are used to verify reported faults in accordance with workplace procedures
	2.3	Faults are reproduced and monitored, if possible, in accordance with workplace procedures
3 Find fault	**3.1**	Isolations are confirmed, where appropriate, in accordance with workplace procedures
	3.2	Fault finding is carried out with others, in accordance with workplace procedures
	3.3	Mechanical equipment components, pipe work, fittings and support fixings are inspected for obvious faults, in accordance with workplace procedures
	3.4	Test and measurement instruments are used, in accordance with workplace procedures and manufacturers' specification
4 Determine cause of fault	**4.1**	Appropriate personnel are consulted, if required, about faulty mechanical equipment, in accordance with workplace procedures
	4.2	Maintenance records on mechanical equipment are consulted, in accordance with workplace procedures
	4.3	Conclusions about the nature and cause of the fault, based on analysis of evidence, are used, in accordance with workplace procedures
5 Repair fault	**5.1**	Isolations are confirmed, where appropriate, in accordance with workplace procedures site requirements
	5.2	Faulty, worn, damaged or unsecured components are replaced or repaired, in accordance with workplace procedures
	5.3	Parts and components are selected and replaced, as required, in accordance with workplace procedures and manufacturers' specification
	5.4	All faults are repaired or rectified, in accordance with the work plan
	5.5	Final inspection is performed, in accordance with

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	workplace procedures
6 Complete work	**6.1** Work is completed and appropriate personnel are notified, in accordance with workplace procedures
	6.2 Work area is cleared of waste, cleaned, restored and secured, in accordance with workplace procedures
	6.3 Tools and equipment are cleaned, maintained and stored in accordance with workplace procedures
	6.4 Work completion details are finalised, in accordance with workplace procedures

Foundation Skills

Foundation skills essential to performance are explicit in the performance criteria of this unit of competency.

Range of Conditions

Range is restricted to essential operating conditions and any other variables essential to the work environment.

Non-essential conditions may be found in the Companion Volume Implementation Guide.

Unit Mapping Information

This unit replaces and is equivalent to UEPMNT317B Diagnose and repair faults in mechanical equipment.

Links

Companion Volume implementation guides are found in VETNet - https://vetnet.gov.au/Pages/TrainingDocs.aspx?q=1715b9fa-e7bd-441c-bb8d-cf22c9c825a8

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Assessment Requirements for UEPMNT317 Diagnose and repair faults in mechanical equipment

Modification History

Release 1. This is the first release of this unit of competency in the UEP Generation Training Package.

Performance Evidence

Evidence required to demonstrate competence in this unit must be relevant to and satisfy all the requirements of the elements, performance criteria and range of conditions on at least two separate occasions and includes:

- applying Work, Health and Safety (WHS)/Occupational Health and Safety (OHS) requirements including:
  - emergency procedures
  - hazard identification
  - safe working practices
  - using risk control measures
- communicating with personnel
- completing work as per scheduled requirements
- determining cause of mechanical equipment fault
- determining permit to work requirements
- finding mechanical equipment fault using fault finding and diagnostic techniques
- identifying equipment and materials
- interpreting manufacturers' specifications and manuals
- locating technical drawings and plans
- planning for diagnosing and repairing faults in mechanical equipment work
- repairing mechanical equipment fault using repairing techniques and procedures
- utilising levelling and alignment techniques
- utilising test and measurement instruments
- verifying mechanical equipment fault using verification techniques
- working with tools and equipment

Knowledge Evidence

Evidence required to demonstrate competence in this unit must be relevant to and satisfy all the requirements of the elements, performance criteria and range of conditions and includes knowledge of:

- equipment and materials

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- fault finding and diagnostic techniques
- generation plant and equipment, its location and operation
- legislation, industry standards, codes of practice and regulations
- manufacturers' specifications and manuals
- performance, characteristics and function of mechanical equipment
- permit to work system
- repair techniques
- technical drawings and plans
- typical arrangements of power production plant
- WHS/OHS legislated requirements including:
  - emergency procedures
  - hazard identification
  - safe working practices
  - using risk control measures
- workplace documentation
- workplace policies and procedures

Assessment Conditions

As a minimum, assessors must satisfy applicable regulatory requirements, which include requirements in the Standards for Registered Training Organisations current at the time of assessment.

As a minimum, assessment must satisfy applicable regulatory requirements, which include requirements in the Standards for Registered Training Organisations current at the time of assessment.

Assessment processes and techniques must be appropriate to the language, literacy and numeracy requirements of the work being performed and the needs of the candidate.

Assessment must occur in workplace operational situations. Where this is not appropriate, assessment must occur in simulated workplace operational situations that reflect workplace conditions. Resources for assessment must include access to:

- a range of relevant exercises, case studies and/or other simulations
- relevant and appropriate materials, tools, equipment and personal protective equipment currently used in industry
- applicable documentation including workplace procedures, industry standards, equipment specifications, regulations, codes of practice and operation manuals.

Links

Companion Volume implementation guides are found in VETNet - https://vetnet.gov.au/Pages/TrainingDocs.aspx?q=1715b9fa-e7bd-441c-bb8d-cf22c9c825a8

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UEPMNT318 Conduct generator mechanical maintenance

Modification History

Release 1. This is the first release of this unit of competency in the UEP Generation Training Package.

Application

This unit involves the skills and knowledge required to conduct mechanical maintenance on an electrical generating unit.

A power generation facility typically maintains several independent generating units which can be brought online or taken offline as demand fluctuates in the system. Regular maintenance ensures that all electrical generating units are operating to maximum efficiency.

Competency in this unit requires the ability to plan work, remove associated equipment, perform generator maintenance, replace generator associated equipment and to report on all completed work tasks. Individuals will, in general, work under supervision in an electrical, electronic, and/or mechanical equipment repair workshop or on site.

Power generation maintenance personnel are typically trained and authorised to receive permits to work.

No licensing, legislative or certification requirements apply to this unit at the time of publication.

Note: Workplace practice

The application of the skills and knowledge described in this unit of competency may require a licence or training permit to practice in the workplace, where work is carried out on gas and electrical installations. Additional and/or other conditions may apply under state and territory legislative and regulatory licensing requirements.

Pre-requisite Unit

MEM18006C Repair and fit engineering components

MEM09002B Interpret technical drawing

MEM12023A Perform engineering measurements

MEM18001C Use hand tools

MEM18002B Use power tools/hand held operations

MEM18003C Use tools for precision work

MEM18055B Dismantle, replace and assemble engineering components

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Competency Field

Maintenance

Unit Sector

Electricity generation

Elements and Performance Criteria

ELEMENTS	PERFORMANCE CRITERIA
Elements describe the essential outcomes.	Performance criteria describe the performance needed to demonstrate achievement of the element.
1 Plan and prepare for work	**1.1** Requirements including scope of work and assigned tasks are identified and confirmed with appropriate personnel or by site inspection, in accordance with workplace procedures
	1.2 Work, Health and Safety (WHS)/Occupational Health and Safety (OHS) regulations, legislative requirements, industry standards, codes of practice, manufacturers' specifications, environmental obligations and workplace procedures are reviewed in preparation for work
	1.3 Resources are obtained and inspected, in accordance with workplace procedures, for compliance with job specification
	1.4 Relevant plans, drawings and manuals are selected and used, in accordance with workplace procedures
	1.5 Correct materials and components for work are obtained and inspected, in accordance with workplace procedures, for compliance with job specification
	1.6 Work is planned, sequenced and prioritised, in accordance with workplace procedures
	1.7 Potential hazards are identified and risk control measures are selected and implemented, in accordance with workplace procedures
	1.8 Work area is prepared, in accordance with workplace procedures

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2 Remove associated equipment	**2.1** Work notations are confirmed, in accordance with workplace procedures
	2.2 Associated generator equipment is disconnected, in accordance with workplace procedures
	2.3 Associated generator equipment is removed, in accordance with workplace procedures
	2.4 Associated generator equipment is inspected for abnormalities, in accordance with workplace procedures
3 Perform generator maintenance	**3.1** Generator maintenance is performed, in accordance with workplace procedures and manufacturers' specification
	3.2 Generator is dismantled, clearly marked for identification and relevant data or sketches are noted or drawn, in accordance with workplace procedures
	3.3 Components are prepared for reassembly, in accordance with manufacturers' drawings or manuals and workplace procedures
	3.4 New components are inspected, in accordance with workplace procedures, to ensure compliance with manufacturers' specification
	3.5 Dimensional inspection is performed, in accordance with workplace procedures, on generator and components to ensure compliance with manufacturers' specifications
	3.6 Components are reassembled for testing, in accordance with workplace procedures and manufacturers' specification
	3.7 Components are levelled, aligned and coupled, in accordance with workplace procedures and manufacturers' specification
4 Replace generator associated equipment	**4.1** Associated generator equipment is replaced and connected, in accordance with workplace procedures
	4.2 Generator is rotated and checks are carried out, in accordance with workplace procedures, to ensure operating conditions are in accordance with manufacturers' specifications
	4.3 Modifications outside of manufacturers' specifications

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		are approved by appropriate personnel and are documented, in accordance with workplace procedures
	4.4	Final inspection is completed, in accordance with workplace procedures
5 Complete work	**5.1**	Work is completed and appropriate personnel are notified, in accordance with workplace procedures
	5.2	Work area is cleared of waste, cleaned, restored and secured, in accordance with workplace procedures
	5.3	Tools and equipment are cleaned, maintained and stored, in accordance with workplace procedures
	5.4	Work completion details are finalised, in accordance with workplace procedures

Foundation Skills

Foundation skills essential to performance are explicit in the performance criteria of this unit of competency.

Range of Conditions

Range is restricted to essential operating conditions and any other variables essential to the work environment.

Non-essential conditions may be found in the Companion Volume Implementation Guide.

Unit Mapping Information

This unit replaces and is equivalent to UEPMNT318B Conduct generator mechanical maintenance.

Links

Companion Volume implementation guides are found in VETNet - https://vetnet.gov.au/Pages/TrainingDocs.aspx?q=1715b9fa-e7bd-441c-bb8d-cf22c9c825a8

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Assessment Requirements for UEPMNT318 Conduct generator mechanical maintenance

Modification History

Release 1. This is the first release of this unit of competency in the UEP Generation Training Package.

Performance Evidence

Evidence required to demonstrate competence in this unit must be relevant to and satisfy all the requirements of the elements, performance criteria and range of conditions on at least two separate occasions and includes:

- applying Work, Health and Safety (WHS)/Occupational Health and Safety (OHS) requirements including:
  - ascertaining hazardous materials
  - emergency procedures
  - risk control measures
  - safe working practices
- assembling and disassembling equipment
- balancing, levelling and aligning
- communicating with personnel
- completing work as per scheduling requirements
- conducting transmissions and/or couplings
- determining permit to work
- identifying components including recognising worn, damaged or faulty components
- interpreting technical drawing, manufacturers' specifications and manuals
- performing generator mechanical maintenance using overhaul and maintenance techniques and procedures
- planning for generator mechanical maintenance work
- removing generator mechanical associated equipment using removal techniques and procedures
- replacing generator mechanical associated equipment using replacement techniques and procedures
- undertaking isolations
- using tools and measuring equipment
- utilising assessment and data analysis techniques and tools
- working with diagnosis and testing techniques

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Knowledge Evidence

Evidence required to demonstrate competence in this unit must be relevant to and satisfy all the requirements of the elements, performance criteria and range of conditions and includes knowledge of:

- advanced balancing, levelling and aligning techniques
- construction of mechanical generators
- diagnostic and testing techniques
- generator mechanical maintenance
- isolations
- legislation, industry standards, codes of practice and regulations
- manufacturers' specifications
- measuring equipment
- permit to work system
- plant and equipment and its location
- technical drawings and plans
- tools
- transmissions and couplings
- typical arrangements of power production plant
- WHS/OHS legislated requirements including:
  - ascertaining hazardous materials
  - emergency procedures
  - risk control measures
  - safe working practices
- workplace documentation
- workplace policies and procedures

Assessment Conditions

As a minimum, assessors must satisfy applicable regulatory requirements, which include requirements in the Standards for Registered Training Organisations current at the time of assessment.

As a minimum, assessment must satisfy applicable regulatory requirements, which include requirements in the Standards for Registered Training Organisations current at the time of assessment.

Assessment processes and techniques must be appropriate to the language, literacy and numeracy requirements of the work being performed and the needs of the candidate.

Assessment must occur in workplace operational situations. Where this is not appropriate, assessment must occur in simulated workplace operational situations that reflect workplace conditions. Resources for assessment must include access to:

- a range of relevant exercises, case studies and/or other simulations
- relevant and appropriate materials, tools, equipment and personal protective equipment

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currently used in industry
- applicable documentation including workplace procedures, industry standards, equipment specifications, regulations, codes of practice and operation manuals.

Links

Companion Volume implementation guides are found in VETNet - https://vetnet.gov.au/Pages/TrainingDocs.aspx?q=1715b9fa-e7bd-441c-bb8d-cf22c9c825a8

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UEPMNT340 Fabricate metal structures and components

Modification History

Release 1. This is the first release of this unit of competency in the UEP Generation Training Package.

Application

This unit involves the skills and knowledge required to fabricate metal structures and components required to facilitate the installation, modification and maintenance of equipment associated with the electricity supply industry generation sector.

Fabrication is the construction of metal structures and components using cutting, bending and assembling processes.

Competency in this unit requires the ability to plan work, fabricate structures and components and to report on all completed work tasks. Individuals will, in general, work under supervision in an electrical, electronic and/or mechanical equipment repair workshop or on site.

Power generation maintenance personnel are typically trained and authorised to receive permits to work.

No licensing, legislative or certification requirements apply to this unit at the time of publication.

Note: Workplace practice

The application of the skills and knowledge described in this unit of competency may require a licence or training permit to practice in the workplace, where work is carried out on gas and electrical installations. Additional and/or other conditions may apply under state and territory legislative and regulatory licensing requirements.

Pre-requisite Unit

MEM18006C Repair and fit engineering components

MEM09002B Interpret technical drawing

MEM12023A Perform engineering measurements

MEM18001C Use hand tools

MEM18002B Use power tools/hand held operations

MEM18003C Use tools for precision work

MEM18055B Dismantle, replace and assemble engineering components

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Competency Field

Maintenance

Unit Sector

Electricity generation

Elements and Performance Criteria

ELEMENTS	PERFORMANCE CRITERIA
Elements describe the essential outcomes.	Performance criteria describe the performance needed to demonstrate achievement of the element.
1 Plan and prepare for work	**1.1** Requirements including scope of work and assigned roles are identified and confirmed with appropriate personnel or by site inspection, in accordance with workplace procedures
	1.2 Work, Health and Safety (WHS)/Occupational Health and Safety (OHS) regulations, legislative requirements, industry standards, codes of practice, manufacturers' specifications, environmental obligations and workplace procedures are reviewed in preparation for work
	1.3 Resources are obtained and inspected for compliance with job specification
	1.4 Relevant plans, drawings and manuals are selected and used, in accordance with workplace procedures
	1.5 Correct materials and components for work are obtained and inspected, in accordance with workplace procedures, for compliance with job specification
	1.6 Work is planned, sequenced and prioritised, in accordance with workplace procedures
	1.7 Potential hazards are identified and risk control measures are selected and implemented, in accordance with workplace procedures
	1.8 Work area is prepared, in accordance with workplace procedures
2 Fabricate metal structures	**2.1** Materials are prepared prior to fabrication, in

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and components		accordance with workplace procedures
	2.2	Jigs or templates are manufactured, as required, in accordance with workplace procedures
	2.3	Materials are marked out and dimensions are checked, in accordance with workplace procedures
	2.4	Materials are cut and formed, using appropriate machinery and tools, in accordance with workplace procedures
	2.5	Tools and equipment are operated during fabrication tasks, in accordance with workplace procedures and manufacturers' specifications
	2.6	Metal structures and components are assembled, using appropriate methods, in accordance with workplace procedures and manufacturers' specifications
	2.7	Distortion is prevented or controlled by applying appropriate techniques, in accordance with workplace procedures
	2.8	Final inspection is performed, in accordance with workplace procedures
3 Complete work	**3.1**	Work is completed and appropriate personnel are notified, in accordance with workplace procedures
	3.2	Work area is cleared of waste, cleaned, restored and secured in accordance with workplace procedures
	3.3	Tools and equipment are cleaned, maintained and stored, in accordance with workplace procedures
	3.4	Work completion details are finalised, in accordance with workplace procedures

Foundation Skills

Foundation skills essential to performance are explicit in the performance criteria of this unit of competency.

Range of Conditions

Range is restricted to essential operating conditions and any other variables essential to the work

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environment.

Non-essential conditions may be found in the Companion Volume Implementation Guide.

Unit Mapping Information

This unit replaces and is equivalent to UEPMNT340B Fabricate metal structures and components

Links

Companion Volume implementation guides are found in VETNet - https://vetnet.gov.au/Pages/TrainingDocs.aspx?q=1715b9fa-e7bd-441c-bb8d-cf22c9c825a8

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Assessment Requirements for UEPMNT340 Fabricate metal structures and components

Modification History

Release 1. This is the first release of this unit of competency in the UEP Generation Training Package.

Performance Evidence

Evidence required to demonstrate competence in this unit must be relevant to and satisfy all the requirements of the elements, performance criteria and range of conditions on at least two separate occasions and includes:

- applying Work, Health and Safety/Occupational Health and Safety (OHS) requirements including:
  - emergency procedures
  - hazard identification
  - risk control measures
  - safe working practices
- communicating with personnel
- completing work as per scheduling requirements
- determining permit to work requirements
- fabricating and assembling metal structures and components
- fabricating metal structures and components
- fabricating, assembling and installing structures and components
- implementing legislation, industry standards, codes of practices and regulations
- interpreting manufacturers' specifications and manuals
- laying out and marking out metal structures and components
- making jigs and templates
- performing precision measurements
- planning for fabricating metal structures and components work
- reading technical drawings
- selecting materials and resources
- using tools and equipment

Knowledge Evidence

Evidence required to demonstrate competence in this unit must be relevant to and satisfy all the requirements of the elements, performance criteria and range of conditions and includes knowledge of:

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- assembly techniques
- distortion control
- fabrication of metal structures and components
- generation plant and equipment and its location
- jigs and templates
- legislation, industry standards, codes of practice and regulations
- manufacturers' specifications and manuals
- mechanical cutting, forming and shaping
- permit to work system
- sheet metal work
- technical drawings
- tools and equipment
- typical arrangements of power production plant
- WHS/OHS legislated requirements including:
  - emergency procedures
  - hazard identification
  - risk control measures
  - safe working practices
- workplace documentation
- workplace policies and procedures

Assessment Conditions

As a minimum, assessors must satisfy applicable regulatory requirements, which include requirements in the Standards for Registered Training Organisations current at the time of assessment.

As a minimum, assessment must satisfy applicable regulatory requirements, which include requirements in the Standards for Registered Training Organisations current at the time of assessment.

Assessment processes and techniques must be appropriate to the language, literacy and numeracy requirements of the work being performed and the needs of the candidate.

Assessment must occur in workplace operational situations. Where this is not appropriate, assessment must occur in simulated workplace operational situations that reflect workplace conditions. Resources for assessment must include access to:

- a range of relevant exercises, case studies and/or other simulations
- relevant and appropriate materials, tools, equipment and personal protective equipment currently used in industry
- applicable documentation including workplace procedures, industry standards, equipment specifications, regulations, codes of practice and operation manuals.

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Companion Volume implementation guides are found in VETNet - https://vetnet.gov.au/Pages/TrainingDocs.aspx?q=1715b9fa-e7bd-441c-bb8d-cf22c9c825a8

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UEPMNT346 Maintain electrical equipment

Modification History

Release 1. This is the first release of this unit of competency in the UEP Generation Training Package.

Application

This unit involves the skills and knowledge required to undertake the maintenance of electrical equipment including, but not limited to, rotating and static machines, appliances, luminaries and associated control equipment, but it excludes High Voltage (H.V.) equipment.

Maintenance is an essential part of the ongoing care and upkeep of electrical equipment, defined as any machine, simple or complex, powered by electricity in a power generation facility, that is undertaken to ensure optimal efficiency.

Competency in this unit requires the ability to plan work, carry out maintenance on electrical equipment and to report on all completed work tasks. Individuals will, in general, work under supervision in an electrical, electronic and/or mechanical equipment repair workshop or on site.

Power generation maintenance personnel are typically trained and authorised to receive permits to work.

No licensing, legislative or certification requirements apply to this unit at the time of publication.

Note: Workplace practice

The application of the skills and knowledge described in this unit of competency may require a licence or training permit to practice in the workplace, where work is carried out on gas and electrical installations. Additional and/or other conditions may apply under state and territory legislative and regulatory licensing requirements.

Pre-requisite Unit

UEENEEG108A Troubleshoot and repair faults in low voltage electrical apparatus and circuits

UEENEEE102A Fabricate, assemble and dismantle utilities industry components

UEENEEE105A Fix and secure electrotechnology equipment

UEENEEE107A Use drawings, diagrams, schedules, standards, codes and specifications

UEENEEG006A Solve problems in single and three phase low voltage machines

UEENEEG033A Solve problems in single and three phase low voltage electrical apparatus and circuits

UEENEEG063A Arrange circuits, control and protection for general electrical installations

UEENEEG101A Solve problems in electromagnetic devices and related circuits

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UEENEEG102A Solve problems in low voltage A.C. circuits

UEENEEG106A Terminate cables, cords and accessories for low voltage circuits

Competency Field

Maintenance

Unit Sector

Electricity generation

Elements and Performance Criteria

ELEMENTS	PERFORMANCE CRITERIA
Elements describe the essential outcomes.	Performance criteria describe the performance needed to demonstrate achievement of the element.
1 Plan and prepare for work	**1.1** Requirements including scope of work and assigned roles are identified and confirmed with appropriate personnel or by site inspection, in accordance with workplace procedures
	1.2 Work, Health and Safety (WHS/Occupational Health and Safety (OHS) regulations, legislative requirements, industry standards, codes of practice, manufacturers' specifications, environmental obligations and workplace procedures are reviewed in preparation for work
	1.3 Resources are obtained and inspected for compliance with job specification
	1.4 Relevant plans, drawings and manuals are selected and used, in accordance with workplace procedures
	1.5 Correct materials and components for work are obtained and inspected, in accordance with workplace procedures, for compliance with job specification
	1.6 Work is planned, sequenced and prioritised, in accordance with workplace procedures
	1.7 Potential hazards are identified and risk control measures are selected and implemented, in accordance with the workplace procedures

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	1.8	Work area is prepared, in accordance with workplace procedures
2 Carry out electrical equipment maintenance	**2.1**	Isolations are confirmed, in accordance with workplace procedures
	2.2	Electrical equipment is maintained using appropriate plans, drawings and manuals, in accordance with workplace procedures
	2.3	Resets or adjustments to electrical equipment are carried out, in accordance with workplace procedures
	2.4	Maintenance on electrical equipment is completed, in accordance with workplace procedures, without damage or loss to other equipment
	2.5	Final inspection of electrical equipment is carried out, in accordance with workplace procedures
3 Complete work	**3.1**	Work is completed and appropriate personnel are notified, in accordance with workplace procedures
	3.2	Work area is cleared of waste, cleaned, restored and secured, in accordance with workplace procedures
	3.3	Tools and equipment are cleaned, maintained and stored, in accordance with workplace procedures
	3.4	Work completion details are finalised, in accordance with workplace procedures

Foundation Skills

Foundation skills essential to performance are explicit in the performance criteria of this unit of competency.

Range of Conditions

Range is restricted to essential operating conditions and any other variables essential to the work environment.

Non-essential conditions may be found in the Companion Volume Implementation Guide.

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Unit Mapping Information

This unit replaces and is equivalent to UEPMNT346B Maintain electrical equipment.

Links

Companion Volume implementation guides are found in VETNet - https://vetnet.gov.au/Pages/TrainingDocs.aspx?q=1715b9fa-e7bd-441c-bb8d-cf22c9c825a8

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Assessment Requirements for UEPMNT346 Maintain electrical equipment

Modification History

Release 1. This is the first release of this unit of competency in the UEP Generation Training Package.

Performance Evidence

Evidence required to demonstrate competence in this unit must be relevant to and satisfy all the requirements of the elements, performance criteria and range of conditions on at least two separate occasions and includes:

- applying Work, Health and Safety(WHS)/Occupational Health and Safety (OHS) requirements including:
  - emergency procedures
  - hazard identification
  - risk control measures
  - safe working practices
- carrying out electrical equipment maintenance using tools and equipment
- communicating with personnel
- determining permit to work requirements
- finalising work completion details
- identifying and selecting resources and materials
- implementing legislation, industry standards, codes of practice and regulations
- maintaining electrical equipment using manufacturers' specifications and manuals
- performing isolations
- planning for electrical equipment maintenance work
- resetting and/or readjusting electrical equipment

Knowledge Evidence

Evidence required to demonstrate competence in this unit must be relevant to and satisfy all the requirements of the elements, performance criteria and range of conditions and includes knowledge of:

- electrical equipment
- isolations
- legislation, industry standards, codes of practice and regulations
- maintenance of electrical equipment
- maintenance techniques

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- manufacturers' specifications and manuals
- permit to work system
- power generation plant and equipment, its location and characteristics
- typical arrangements of power production plant
- WHS/OHS legislated requirements including:
  - emergency procedures
  - hazard identification
  - risk control measures
  - safe working practices
- workplace documentation
- workplace policies and procedures

Assessment Conditions

As a minimum, assessors must satisfy applicable regulatory requirements, which include requirements in the Standards for Registered Training Organisations current at the time of assessment.

As a minimum, assessment must satisfy applicable regulatory requirements, which include requirements in the Standards for Registered Training Organisations current at the time of assessment.

Assessment processes and techniques must be appropriate to the language, literacy and numeracy requirements of the work being performed and the needs of the candidate.

Assessment must occur in workplace operational situations. Where this is not appropriate, assessment must occur in simulated workplace operational situations that reflect workplace conditions.

Resources for assessment must include access to:

- a range of relevant exercises, case studies and/or other simulations
- relevant and appropriate materials, tools, equipment and personal protective equipment currently used in industry
- applicable documentation including workplace procedures, industry standards, equipment specifications, regulations, codes of practice and operation manuals.

Links

Companion Volume implementation guides are found in VETNet - https://vetnet.gov.au/Pages/TrainingDocs.aspx?q=1715b9fa-e7bd-441c-bb8d-cf22c9c825a8

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UEPMNT347 Maintain complex electrical equipment

Modification History

Release 1. This is the first release of this unit of competency in the UEP Generation Training Package.

Application

This unit involves the skills and knowledge required to undertake the maintenance of complex High Voltage (H.V.) electrical equipment.

Maintenance is an essential part of the ongoing care and upkeep of complex and High Voltage electrical equipment that is undertaken to ensure optimal efficiently in a power generation facility.

Competency in this unit requires the ability to plan work, carry out maintenance on complex electrical equipment and to report on all completed work tasks. Individuals will, in general, work under supervision in an electrical, electronic and/or mechanical equipment repair workshop or onsite.

Power generation maintenance personnel are typically trained and authorised to receive permits to work.

No licensing, legislative or certification requirements apply to this unit at the time of publication.

Note: Workplace practice

The application of the skills and knowledge described in this unit of competency may require a licence or training permit to practice in the workplace, where work is carried out on gas and electrical installations. Additional and/or other conditions may apply under state and territory legislative and regulatory licensing requirements.

Pre-requisite Unit

UEPMNT346 Maintain electrical equipment

Competency Field

Maintenance

Unit Sector

Electricity generation

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Elements and Performance Criteria

ELEMENTS	PERFORMANCE CRITERIA
Elements describe the essential outcomes.	Performance criteria describe the performance needed to demonstrate achievement of the element.
1 Plan and prepare for work	**1.1** Requirements including scope of work and assigned roles are identified and confirmed with appropriate personnel or by site inspection, in accordance with workplace procedures
	1.2 Work, Health and Safety (WHS)/Occupational Health and Safety (OHS) regulations, legislative requirements, industry standards, codes of practice, manufacturers' specifications, environmental obligations and workplace procedures are reviewed in preparation for work
	1.3 Resources are obtained and inspected for compliance with job specification
	1.4 Relevant plans, drawings and manuals are selected and used, in accordance with workplace procedures
	1.5 Correct materials and components for work are obtained and inspected, in accordance with workplace procedures, for compliance with job specification
	1.6 Work is planned, sequenced and prioritised, in accordance with workplace procedures
	1.7 Potential hazards are identified and risk control measures are selected and implemented, in accordance with workplace procedures
	1.8 Work area is prepared, in accordance with workplace procedures
2 Carry out complex electrical equipment maintenance	**2.1** Isolations are confirmed, where appropriate, in accordance with workplace procedures
	2.2 Electrical equipment is maintained using appropriate plans, drawings and manuals, in accordance with workplace procedures
	2.3 Resets or adjustments on complex electrical equipment is carried out, in accordance with workplace procedures

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	2.4	Maintenance on complex electrical equipment is completed, in accordance with workplace procedures, without damage or loss to other equipment
	2.5	Final inspection is carried out, in accordance with workplace procedures
3 Complete work	**3.1**	Work is completed and appropriate personnel are notified, in accordance with workplace procedures
	3.2	Work area is cleared of waste, cleaned, restored and secured, in accordance with workplace procedures
	3.3	Tools and equipment are cleaned, maintained and stored, in accordance with workplace procedures
	3.4	Work completion details are finalised, in accordance with workplace procedures

Foundation Skills

Foundation skills essential to performance are explicit in the performance criteria of this unit of competency.

Range of Conditions

Range is restricted to essential operating conditions and any other variables essential to the work environment.

Non-essential conditions may be found in the Companion Volume Implementation Guide.

Unit Mapping Information

This unit replaces and is equivalent to UEPMNT347B Maintain complex electrical equipment.

Links

Companion Volume implementation guides are found in VETNet - https://vetnet.gov.au/Pages/TrainingDocs.aspx?q=1715b9fa-e7bd-441c-bb8d-cf22c9c825a8

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Assessment Requirements for UEPMNT347 Maintain complex electrical equipment

Modification History

Release 1. This is the first release of this unit of competency in the UEP Generation Training Package.

Performance Evidence

Evidence required to demonstrate competence in this unit must be relevant to and satisfy all the requirements of the elements, performance criteria and range of conditions on at least two separate occasions and includes:

- applying Work, Health and Safety (WHS)/Occupational Health and Safety (OHS) requirements including:
  - emergency procedures
  - hazard identification
  - risk control measures
  - safe working practices
- carrying out complex electrical maintenance
- communicating with personnel
- determining permit to work requirements
- finalising work completion details
- implementing legislation, industry standards, codes of practice and regulations
- maintaining complex electrical equipment using maintenance procedures
- performing isolations
- planning for complex electrical equipment maintenance work
- resetting and/or readjustment
- selecting materials
- using manufacturers' specifications, circuit plans and manuals

Knowledge Evidence

Evidence required to demonstrate competence in this unit must be relevant to and satisfy all the requirements of the elements, performance criteria and range of conditions and includes knowledge of:

- circuit plans
- complex electrical equipment
- isolations
- legislation, industry standards, codes of practice and regulations

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- maintenance techniques
- manufacturers' specifications and manuals
- permit to work system
- power generation plant and equipment, and its location
- typical arrangements of power production plant
- WHS/OHS legislated requirements including:
  - emergency procedures
  - hazard identification
  - risk control measures
  - safe working practices
- workplace documentation
- workplace policies and procedures

Assessment Conditions

As a minimum, assessors must satisfy applicable regulatory requirements, which include requirements in the Standards for Registered Training Organisations current at the time of assessment.

As a minimum, assessment must satisfy applicable regulatory requirements, which include requirements in the Standards for Registered Training Organisations current at the time of assessment.

Assessment processes and techniques must be appropriate to the language, literacy and numeracy requirements of the work being performed and the needs of the candidate.

Assessment must occur in workplace operational situations. Where this is not appropriate, assessment must occur in simulated workplace operational situations that reflect workplace conditions. Resources for assessment must include access to:

- a range of relevant exercises, case studies and/or other simulations
- relevant and appropriate materials, tools, equipment and personal protective equipment currently used in industry
- applicable documentation including workplace procedures, industry standards, equipment specifications, regulations, codes of practice and operation manuals.

Links

Companion Volume implementation guides are found in VETNet - https://vetnet.gov.au/Pages/TrainingDocs.aspx?q=1715b9fa-e7bd-441c-bb8d-cf22c9c825a8

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UEPMNT348 Maintain electrical electronic equipment

Modification History

Release 1. This is the first release of this unit of competency in the UEP Generation Training Package.

Application

This unit involves the skills and knowledge required to undertake the maintenance of electronic electrical equipment containing solid state components, complex control panels and complex control equipment.

Maintenance includes performing inspections, testing, measurement, replacement and adjustments on electrical electronic equipment to ensure optimal efficiently.

Competency in this unit requires the ability to plan work, carry out maintenance on electronic electrical equipment and to report on all completed work tasks. Individuals will, in general, work under supervision in an electrical, electronic and/or mechanical equipment repair workshop or on site.

Power generation maintenance personnel are typically trained and authorised to receive permits to work.

No licensing, legislative or certification requirements apply to this unit at the time of publication.

Note: Workplace practice

The application of the skills and knowledge described in this unit of competency may require a licence or training permit to practice in the workplace, where work is carried out on gas and electrical installations. Additional and/or other conditions may apply under state and territory legislative and regulatory licensing requirements.

Pre-requisite Unit

UEENEEG108A Troubleshoot and repair faults in low voltage electrical apparatus and circuits

UEENEEE107A Use drawings, diagrams, schedules, standards, cords and specifications

UEENEEG006A Solve problems in single and three phase low voltage machines

UEENEEG033A Solve problems in single and three phase low voltage electrical apparatus and circuits

UEENEEG063A Arrange circuits, control and protection for general electrical installations

UEENEEG101A Solve problems in electromagnetic devices and related circuits

UEENEEG102A Solve problems in low voltage A.C. circuits

UEENEEG106A Terminate cables, cords and accessories for low voltage circuits

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Competency Field

Maintenance

Unit Sector

Electricity generation

Elements and Performance Criteria

ELEMENTS	PERFORMANCE CRITERIA
Elements describe the essential outcomes.	Performance criteria describe the performance needed to demonstrate achievement of the element.
1 Plan and prepare for work	**1.1** Requirements including scope of work and assigned roles are identified and confirmed with appropriate personnel or by site inspection, in accordance with workplace procedures
	1.2 Work, Health and Safety (WHS)/Occupational Health and Safety (OHS) regulations, legislative requirements, industry standards, codes of practice, manufacturers' specifications, environmental obligations and workplace procedures are reviewed in preparation for work
	1.3 Resources are obtained and inspected for compliance with job specification
	1.4 Relevant plans, drawings and manuals are selected and used, in accordance with workplace procedures
	1.5 Correct materials and components for work are obtained and inspected, in accordance with workplace procedures, for compliance with job specification
	1.6 Work is planned, sequenced and prioritised, in accordance with workplace procedures
	1.7 Potential hazards are identified, and risk control measures are selected and implemented, in accordance with workplace procedures
	1.8 Work area is prepared, in accordance with workplace procedures
2 Carry out maintenance	**2.1** Isolations are confirmed, in accordance with workplace

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		procedures
	2.2	Electrical electronic equipment is maintained using appropriate plans, drawings and manuals, in accordance with workplace procedures
	2.3	Resets or adjustments, are carried out, in accordance with workplace procedures
	2.4	Maintenance, reset or adjustment is completed, in accordance with workplace procedures, without damage or loss to other equipment
	2.5	Final inspection is carried out, in accordance with workplace procedures
3 Complete work	**3.1**	Work is completed and appropriate personnel are notified, in accordance with workplace procedures
	3.2	Work area is cleared of waste, cleaned, restored and secured, in accordance with workplace procedures
	3.3	Tools and equipment are cleaned, maintained and stored, in accordance with workplace procedures
	3.4	Work completion details are finalised, in accordance with workplace procedures

Foundation Skills

Foundation skills essential to performance are explicit in the performance criteria of this unit of competency.

Range of Conditions

Range is restricted to essential operating conditions and any other variables essential to the work environment.

Non-essential conditions may be found in the Companion Volume Implementation Guide.

Unit Mapping Information

This unit replaces and is equivalent to UEPMNT348B Maintain electrical electronic equipment.

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Links

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Assessment Requirements for UEPMNT348 Maintain electrical electronic equipment

Modification History

Release 1. This is the first release of this unit of competency in the UEP Generation Training Package.

Performance Evidence

Evidence required to demonstrate competence in this unit must be relevant to and satisfy all the requirements of the elements, performance criteria and range of conditions on at least two separate occasions and includes:

- applying Work, Health and Safety (WHS)/Occupational Health and Safety (OHS) requirements including:
  - emergency procedures
  - hazard identification
  - risk control procedures
  - safe working practices
- carrying out electrical electronic maintenance using maintenance procedures
- communicating with personnel
- completing work
- determining permit to work requirements
- implementing legislation, industry standards, codes of practice and regulations
- interpreting manufacturers' specifications and manuals
- maintaining electrical electronic equipment
- operating with installation techniques and procedures
- planning for electrical electronic equipment maintenance work
- selecting materials
- using tools and equipment
- utilising data analysis techniques and tools
- working with test and measurement instruments

Knowledge Evidence

Evidence required to demonstrate competence in this unit must be relevant to and satisfy all the requirements of the elements, performance criteria and range of conditions and includes knowledge of:

- characteristics and operation of electronic equipment
- electrical installation practices

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- equipment and materials
- legislation, industry standards, codes of practice and regulations
- maintaining electrical electronic equipment
- maintenance techniques
- manufacturers' specifications and manuals
- permit to work system
- plant and equipment, and its location
- test and measurement instruments
- typical arrangements of power production plant
- WHS/OHS legislated requirements including:
  - emergency procedures
  - hazard identification
  - risk control procedures
  - safe working practices
- workplace documentation
- workplace policies and procedures

Assessment Conditions

As a minimum, assessors must satisfy applicable regulatory requirements, which include requirements in the Standards for Registered Training Organisations current at the time of assessment.

As a minimum, assessment must satisfy applicable regulatory requirements, which include requirements in the Standards for Registered Training Organisations current at the time of assessment.

Assessment processes and techniques must be appropriate to the language, literacy and numeracy requirements of the work being performed and the needs of the candidate.

Assessment must occur in workplace operational situations. Where this is not appropriate, assessment must occur in simulated workplace operational situations that reflect workplace conditions.

Resources for assessment must include access to:

- a range of relevant exercises, case studies and/or other simulations
- relevant and appropriate materials, tools, equipment and personal protective equipment currently used in industry
- applicable documentation including workplace procedures, industry standards, equipment specifications, regulations, codes of practice and operation manuals.

Links

Companion Volume implementation guides are found in VETNet - https://vetnet.gov.au/Pages/TrainingDocs.aspx?q=1715b9fa-e7bd-441c-bb8d-cf22c9c825a8

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UEPMNT350 Modify electrical equipment

Modification History

Release 1. This is the first release of this unit of competency in the UEP Generation Training Package.

Application

This unit involves the skills and knowledge required to perform modifications to electrical equipment which may include, but is not limited to alterations, additions or adjustments.

Electrical equipment is any machine, simple or complex, powered by electricity used in a power generation facility. Modifications can include any changes to electrical equipment which may alter it from the manufacturers' specifications.

Competency in this unit requires the ability to plan work, modifying electrical equipment and to report on all completed work tasks. Individuals will, in general, work under supervision in an electrical, electronic and/or mechanical equipment repair workshop or onsite.

Power generation maintenance personnel are typically trained and authorised to receive permits to work.

No licensing, legislative or certification requirements apply to this unit at the time of publication.

Note: Workplace practice

The application of the skills and knowledge described in this unit of competency may require a licence or training permit to practice in the workplace, where work is carried out on gas and electrical installations. Additional and/or other conditions may apply under state and territory legislative and regulatory licensing requirements.

Pre-requisite Unit

UEENEEG108A Troubleshoot and repair faults in low voltage electrical apparatus and circuits

UEENEEE107A Use drawings, diagrams, schedules, standards, codes and specifications

UEENEEG006A Solve problems in single and three phase low voltage machines

UEENEEG033A Solve problems in single and three phase low voltage electrical apparatus and circuits

UEENEEG063A Arrange circuits, control and protection for general electrical installations

UEENEEG101A Solve problems in electromagnetic devices and related circuits

UEENEEG102A Solve problems in low voltage A.C. circuits

UEENEEG106A Terminate cables, cords and accessories for low voltage circuits

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Competency Field

Maintenance

Unit Sector

Electricity generation

Elements and Performance Criteria

ELEMENTS	PERFORMANCE CRITERIA
Elements describe the essential outcomes.	Performance criteria describe the performance needed to demonstrate achievement of the element.
1 Plan and prepare for work	**1.1** Requirements including scope of work and assigned roles are identified and confirmed with appropriate personnel or by site inspection, in accordance with workplace procedures
	1.2 Work, Health and Safety (WHS)/Occupational Health and Safety (OHS) regulations, legislative requirements, industry standards, codes of practice, manufacturers' specifications, environmental obligations and workplace procedures are reviewed in preparation for work
	1.3 Resources are obtained and inspected for compliance with job specification
	1.4 Relevant plans, drawings and manuals are selected and used, in accordance with workplace procedures
	1.5 Correct materials and components for work are obtained and inspected, in accordance with workplace procedures, for compliance with job specification
	1.6 Work is planned, sequenced prioritised, in accordance with workplace procedures
	1.7 Potential hazards are identified and risk control measures are selected and implemented, in accordance with workplace procedures
	1.8 Work area is prepared, in accordance with workplace procedures
2 Carry out electrical	**2.1** Isolations are confirmed, in accordance with workplace

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equipment modifications		procedures
	2.2	Electrical equipment is modified using appropriate plans, drawings and manuals, in accordance with workplace procedures
	2.3	Modifications on electrical equipment are carried out, in accordance with workplace procedures, without damage or loss to other equipment
	2.4	Modified electrical equipment is set up to meet operational requirements, in accordance with workplace procedures and manufacturers' specification
	2.5	Final inspection on electrical equipment is performed, in accordance with workplace procedures
3 Complete work	**3.1**	Work is completed and appropriate personnel are notified, in accordance with workplace procedures
	3.2	Work area is cleared of waste, cleaned, restored and secured in accordance with workplace procedures
	3.3	Tools and equipment are cleaned, maintained and stored, in accordance with workplace procedures
	3.4	Work completion details are finalised, in accordance with workplace procedures

Foundation Skills

Foundation skills essential to performance are explicit in the performance criteria of this unit of competency.

Range of Conditions

Range is restricted to essential operating conditions and any other variables essential to the work environment.

Non-essential conditions may be found in the Companion Volume Implementation Guide.

Unit Mapping Information

This unit replaces and is equivalent to UEPMNT350B Modify electrical equipment.

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Links

Companion Volume implementation guides are found in VETNet - https://vetnet.gov.au/Pages/TrainingDocs.aspx?q=1715b9fa-e7bd-441c-bb8d-cf22c9c825a8

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Assessment Requirements for UEPMNT350 Modify electrical equipment

Modification History

Release 1. This is the first release of this unit of competency in the UEP Generation Training Package.

Performance Evidence

Evidence required to demonstrate competence in this unit must be relevant to and satisfy all the requirements of the elements, performance criteria and range of conditions on at least two separate occasions and includes:

- applying Work, Health and Safety (WHS)/Occupational Health and Safety (OHS) requirements including:
  - emergency procedures
  - hazard identification
  - risk control measures
  - safe working practices
- applying modification techniques and procedures
- carrying out electrical equipment modifications
- communicating with personnel
- determining permits to work
- finalising work completion details
- inspecting electrical equipment
- modifying electrical equipment
- performing isolations
- planning for electrical equipment modification work
- selecting materials
- using manufacturers' specifications and manuals

Knowledge Evidence

Evidence required to demonstrate competence in this unit must be relevant to and satisfy all the requirements of the elements, performance criteria and range of conditions and includes knowledge of:

- electrical equipment
- inspection techniques
- isolations
- legislation, industry standards, codes of practice and regulations

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- manufacturers' specifications and manuals
- modification techniques
- permit to work system
- power generation plant and equipment, and its location
- typical arrangements of power production plant
- WHS/OHS legislated requirements including:
  - emergency procedures
  - hazard identification
  - risk control measures
  - safe working practices
- workplace documentation
- workplace policies and procedures

Assessment Conditions

As a minimum, assessors must satisfy applicable regulatory requirements, which include requirements in the Standards for Registered Training Organisations current at the time of assessment.

As a minimum, assessment must satisfy applicable regulatory requirements, which include requirements in the Standards for Registered Training Organisations current at the time of assessment.

Assessment processes and techniques must be appropriate to the language, literacy and numeracy requirements of the work being performed and the needs of the candidate.

Assessment must occur in workplace operational situations. Where this is not appropriate, assessment must occur in simulated workplace operational situations that reflect workplace conditions. Resources for assessment must include access to:

- a range of relevant exercises, case studies and/or other simulations
- relevant and appropriate materials, tools, equipment and personal protective equipment currently used in industry
- applicable documentation including workplace procedures, industry standards, equipment specifications, regulations, codes of practice and operation manuals.

Links

Companion Volume implementation guides are found in VETNet - https://vetnet.gov.au/Pages/TrainingDocs.aspx?q=1715b9fa-e7bd-441c-bb8d-cf22c9c825a8

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UEPMNT351 Test and commission electrical equipment

Modification History

Release 1. This is the first release of this unit of competency in the UEP Generation Training Package.

Application

This unit involves the skills and knowledge required to conduct testing and commissioning of electrical wiring systems and equipment.

Commissioning and testing is the process of ensuring that all electrical wiring systems which includes cabling and associated devices such as switches, distribution boards, sockets and fittings and equipment in a power generation facility are meeting operational requirements.

Competency in this unit requires the ability to plan work, test wiring systems, test electrical equipment, commission electrical equipment and to report on all completed work tasks. Individuals will, in general, work under supervision in an electrical, electronic and/or mechanical equipment repair workshop or on site.

Power generation maintenance personnel are typically trained and authorised to receive permits to work.

No licensing, legislative or certification requirements apply to this unit at the time of publication.

Note: Workplace practice

The application of the skills and knowledge described in this unit of competency may require a licence or training permit to practice in the workplace, where work is carried out on gas and electrical installations. Additional and/or other conditions may apply under state and territory legislative and regulatory licensing requirements.

Pre-requisite Unit

UEENEEG108A Troubleshoot and repair faults in low voltage electrical apparatus and circuits

UEENEEE102A Fabricate, assemble and dismantle utilities industry components

UEENEEE104A Solve problems in D.C. circuits

UEENEEE105A Fix and secure electrotechnology equipment

UEENEEE107A Use drawings, diagrams, schedules, standards, codes and specifications

UEENEEG006A Solve problems in single and three phase low voltage machines

UEENEEG033A Solve problems in single and three phase low voltage electrical apparatus and circuits

UEENEEG063A Arrange circuits, control and protection for general electrical installations

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UEENEEG101A Solve problems in electromagnetic devices and related circuits

UEENEEG102A Solve problems in low voltage A.C. circuits

UEENEEG106A Terminate cables, cords and accessories for low voltage circuits

Competency Field

Maintenance

Unit Sector

Electricity generation

Elements and Performance Criteria

ELEMENTS	PERFORMANCE CRITERIA
Elements describe the essential outcomes.	Performance criteria describe the performance needed to demonstrate achievement of the element.
1 Plan and prepare for work	**1.1** Requirements including scope of work and assigned roles are identified and confirmed with appropriate personnel or by site inspection, in accordance with workplace procedures
	1.2 Work, Health and Safety (WHS)/Occupational Health and Safety (OHS) regulations, legislative requirements, industry standards, codes of practice, manufacturers' specifications, environmental obligations and workplace procedures are reviewed in preparation for work
	1.3 Resources are obtained and inspected for compliance with job specification
	1.4 Relevant plans, drawings and manuals are selected and used, in accordance with workplace procedures
	1.5 Correct materials and components for work are obtained and inspected, in accordance with workplace procedures, for compliance with job specification
	1.6 Work is planned, sequenced and prioritised, in accordance with workplace procedures
	1.7 Potential hazards are identified and risk control measures are selected and implemented, in accordance

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		with workplace procedures
	1.8	Work area is prepared, in accordance with workplace procedures and requirements
2 Test electrical wiring systems	**2.1**	Isolations for work are confirmed, in accordance with workplace procedures
	2.2	Electrical wiring systems are tested using appropriate plans, drawings and manuals, in accordance with workplace procedures
	2.3	Electrical wiring systems, including enclosures and/or supports, are inspected in accordance with workplace procedures, prior to testing to ensure absence of any damage, defects and deterioration
	2.4	Fixed electrical wiring is tested, as required, and results are documented to confirm compliance with job specification
3 Test electrical equipment	**3.1**	Isolations are confirmed, where appropriate, in accordance with workplace procedures site requirements
	3.2	Electrical equipment is tested using appropriate plans, drawings and manuals, in accordance with workplace procedures
	3.3	Test conditions are confirmed, and equipment is inspected, in accordance with workplace procedures, to ensure absence of damage, defects and deterioration
	3.4	Electrical equipment is tested using appropriate testing techniques, in accordance with workplace procedures
	3.5	Electrical equipment test results are documented to confirm compliance with job specification
4 Commission electrical equipment	**4.1**	Isolations are confirmed, where appropriate, in accordance with workplace procedures and site requirements
	4.2	Electrical equipment is commissioned using appropriate plans, drawings and manuals, in accordance with workplace procedures
	4.3	Equipment is set up, in accordance with workplace procedures, operational requirements or manufacturers' specifications

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	4.4	Testing and monitoring procedures are followed, and results are documented to ensure electrical equipment functions within manufacturers' specifications
	4.5	Electrical equipment is commissioned, in accordance with workplace procedures
	4.6	Final inspection on electrical equipment is carried out, in accordance with workplace procedures
5 Complete work	**5.1**	Work is completed and appropriate personnel are notified, in accordance with workplace procedures
	5.2	Work area is cleared of waste, cleaned, restored and secured in accordance with workplace procedures
	5.3	Tools and equipment are cleaned, maintained and stored, in accordance with workplace procedures
	5.4	Work completion details are finalised, in accordance with workplace procedures

Foundation Skills

Foundation skills essential to performance are explicit in the performance criteria of this unit of competency.

Range of Conditions

Range is restricted to essential operating conditions and any other variables essential to the work environment.

Non-essential conditions may be found in the Companion Volume Implementation Guide.

Unit Mapping Information

This unit replaces and is equivalent to UEPMNT351B Test and commission electrical equipment.

Links

Companion Volume implementation guides are found in VETNet - https://vetnet.gov.au/Pages/TrainingDocs.aspx?q=1715b9fa-e7bd-441c-bb8d-cf22c9c825a8

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Assessment Requirements for UEPMNT351 Test and commission electrical equipment

Modification History

Release 1. This is the first release of this unit of competency in the UEP Generation Training Package.

Performance Evidence

Evidence required to demonstrate competence in this unit must be relevant to and satisfy all the requirements of the elements, performance criteria and range of conditions on at least two separate occasions and includes:

- applying Work, Health and Safety (WHS)/Occupational Health and Safety (OHS) requirements including:
  - emergency procedures
  - hazard identification
  - risk control measures
  - safe working practices
- commissioning electrical equipment
- completing work as per scheduling requirements communicating with personnel
- determining permit to work requirements
- implementing legislation, industry standards, codes of practice and regulations
- inspecting and testing wiring systems
- inspecting, testing and monitoring electrical equipment
- planning testing and commissioning electrical equipment work
- selecting materials
- using manufacturers' specifications and manuals

Knowledge Evidence

Evidence required to demonstrate competence in this unit must be relevant to and satisfy all the requirements of the elements, performance criteria and range of conditions and includes knowledge of:

- characteristics and operation of electrical equipment
- electrical equipment commissioning
- equipment and materials
- inspections of wiring systems and electrical equipment
- isolations
- legislation, industry standards, codes of practice and regulations

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- manufacturers' specifications and manuals
- permit to work system
- power generation plant and equipment, and its location
- testing methods and techniques
- typical arrangements of power production plant
- WHS/OHS legislated requirements including:
  - emergency procedures
  - hazard identification
  - risk control measures
  - safe working practices
- workplace documentation
- workplace policies and procedures

Assessment Conditions

As a minimum, assessors must satisfy applicable regulatory requirements, which include requirements in the Standards for Registered Training Organisations current at the time of assessment.

As a minimum, assessment must satisfy applicable regulatory requirements, which include requirements in the Standards for Registered Training Organisations current at the time of assessment.

Assessment processes and techniques must be appropriate to the language, literacy and numeracy requirements of the work being performed and the needs of the candidate.

Assessment must occur in workplace operational situations. Where this is not appropriate, assessment must occur in simulated workplace operational situations that reflect workplace conditions. Resources for assessment must include access to:

- a range of relevant exercises, case studies and/or other simulations
- relevant and appropriate materials, tools, equipment and personal protective equipment currently used in industry
- applicable documentation including workplace procedures, industry standards, equipment specifications, regulations, codes of practice and operation manuals.

Links

Companion Volume implementation guides are found in VETNet - https://vetnet.gov.au/Pages/TrainingDocs.aspx?q=1715b9fa-e7bd-441c-bb8d-cf22c9c825a8

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UEPMNT355 Install complex electronic instrumentation equipment

Modification History

Release 1. This is the first release of this unit of competency in the UEP Generation Training Package.

Application

This unit involves the skills and knowledge required to undertake the installation of complex electronic instrumentation equipment used in multi-loop configurations including, but not limited to, totaliser units, laboratory and field analysers and signal characterising, microprocessor control, interface, ultrasonic and nucleonic equipment.

Installation of complex electronic instrumentation equipment in a power generation facility is typically performed in conjunction with manufacturers' specifications to ensure serviceability and reliability.

Competency in this unit requires the ability to plan work, install complex electronic instrumentation equipment and to report on all completed work tasks. Individuals will, in general, work under supervision in an electrical, electronic and/or mechanical equipment repair workshop or on site.

Power generation maintenance personnel are typically trained and authorised to receive permits to work.

No licensing, legislative or certification requirements apply to this unit at the time of publication.

Note: Workplace practice

The application of the skills and knowledge described in this unit of competency may require a licence or training permit to practice in the workplace, where work is carried out on gas and electrical installations. Additional and/or other conditions may apply under state and territory legislative and regulatory licensing requirements.

Pre-requisite Unit

UEENEEI108A Install instrumentation and control apparatus and associated equipment

UEENEEI001B Install and set up transducers and sensing devices

UEENEEE102A Fabricate, assemble and dismantle utilities industry components

UEENEEE105A Fix and secure electrotechnology equipment

UEENEEE107A Use drawings, diagrams, schedules, standards, codes and specifications

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Competency Field

Maintenance

Unit Sector

Electricity generation

Elements and Performance Criteria

ELEMENTS	PERFORMANCE CRITERIA
Elements describe the essential outcomes.	Performance criteria describe the performance needed to demonstrate achievement of the element.
1 Plan and prepare for work	**1.1** Requirements including scope of work and assigned roles are identified and confirmed with appropriate personnel or by site inspection, in accordance with workplace procedures
	1.2 Work, Health and Safety (WHS)/Occupational Health and Safety (OHS) regulations, legislative requirements, industry standards, codes of practice, manufacturers' specifications, environmental obligations and workplace procedures are reviewed in preparation for work
	1.3 Resources are obtained and inspected for compliance with job specification
	1.4 Relevant plans, drawings and manuals are selected and used, in accordance with workplace procedures
	1.5 Correct materials and components for work are obtained and inspected, in accordance with workplace procedures, for compliance with job specification
	1.6 Work is planned, sequenced and prioritised, in accordance with workplace procedures and
	1.7 Potential hazards are identified and risk control measures are selected and implemented, in accordance with workplace procedures
	1.8 Work area is prepared, in accordance with workplace and site procedures
2 Install complex electronic instrumentation	**2.1** Isolations are confirmed, in accordance with workplace

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equipment		procedures
	2.2	Electronic instrumentation equipment is assembled, positioned and secured, in accordance with workplace procedures, plans, drawings and manuals
	2.3	Conductors are run, secured, glanded and terminated to job specifications, in accordance with workplace procedures
	2.4	Final inspection is carried out, in accordance with workplace procedures
3 Complete work	**3.1**	Work is completed and appropriate personnel are notified, in accordance with workplace procedures
	3.2	Work area is cleared of waste, cleaned, restored and secured, in accordance with workplace procedures
	3.3	Tools and equipment are cleaned, maintained and stored, in accordance with workplace procedures
	3.4	Work completion details are finalised, in accordance with workplace procedures

Foundation Skills

Foundation skills essential to performance are explicit in the performance criteria of this unit of competency.

Range of Conditions

Range is restricted to essential operating conditions and any other variables essential to the work environment.

Non-essential conditions may be found in the Companion Volume Implementation Guide.

Unit Mapping Information

This unit replaces and is equivalent to UEPMNT355B Install complex electronic instrumentation equipment.

Links

Companion Volume implementation guides are found in VETNet - https://vetnet.gov.au/Pages/TrainingDocs.aspx?q=1715b9fa-e7bd-441c-bb8d-cf22c9c825a8

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Assessment Requirements for UEPMNT355 Install complex electronic instrumentation equipment

Modification History

Release 1. This is the first release of this unit of competency in the UEP Generation Training Package.

Performance Evidence

Evidence required to demonstrate competence in this unit must be relevant to and satisfy all the requirements of the elements, performance criteria and range of conditions on at least two separate occasions and includes:

- applying Work, Health and Safety (WHS)/Occupational Health and Safety (OHS) requirements including:
  - emergency procedures
  - hazard identification
  - risk control measures
  - safe working practices
- communicating with personnel
- completing work as per scheduled requirements
- determining permit to work requirements
- identifying and selecting materials
- implementing legislation, codes of practice, regulations and industry standards
- installing electronic instrumentation equipment using installing techniques and procedures
- interpreting technical drawings and manufacturers' manuals
- planning for installing complex electronic instrumentation equipment work
- undertaking termination procedures
- using tools and equipment
- utilising test and measurement instruments

Knowledge Evidence

Evidence required to demonstrate competence in this unit must be relevant to and satisfy all the requirements of the elements, performance criteria and range of conditions and includes knowledge of:

- equipment and materials
- installation requirements
- installing electronic instrumentation equipment
- isolations

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- legislation, industry standards, codes of practice and regulations
- manufacturers' specifications and manuals
- permit to work system
- plant and equipment and its location
- test and measurement instruments
- typical arrangements of power production plant
- WHS/OHS legislated requirements including:
  - emergency procedures
  - hazard identification
  - risk control measures
  - safe working practices
- workplace documentation
- workplace policies and procedures

Assessment Conditions

As a minimum, assessors must satisfy applicable regulatory requirements, which include requirements in the Standards for Registered Training Organisations current at the time of assessment.

As a minimum, assessment must satisfy applicable regulatory requirements, which include requirements in the Standards for Registered Training Organisations current at the time of assessment.

Assessment processes and techniques must be appropriate to the language, literacy and numeracy requirements of the work being performed and the needs of the candidate.

Assessment must occur in workplace operational situations. Where this is not appropriate, assessment must occur in simulated workplace operational situations that reflect workplace conditions. Resources for assessment must include access to:

- a range of relevant exercises, case studies and/or other simulations
- relevant and appropriate materials, tools, equipment and personal protective equipment currently used in industry
- applicable documentation including workplace procedures, industry standards, equipment specifications, regulations, codes of practice and operation manuals.

Links

Companion Volume implementation guides are found in VETNet - https://vetnet.gov.au/Pages/TrainingDocs.aspx?q=1715b9fa-e7bd-441c-bb8d-cf22c9c825a8

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UEPMNT356 Maintain instrumentation equipment

Modification History

Release 1. This is the first release of this unit of competency in the UEP Generation Training Package.

Application

This unit involves the skills and knowledge required to undertake the maintenance of instrumentation equipment including, but not limited to, process measurement, control and analytical instrumentation.

Instrumentation equipment measures, monitors or controls flows, temperature, levels or pressure and typically forms part of the control system in a power generation facility. Maintenance is an essential part of the ongoing care and upkeep required to ensure all instrumentation equipment is operationally efficient.

Competency in this unit requires the ability to plan work, maintain instrumentation equipment and to report on all completed work tasks. Individuals will, in general, work under supervision in an electrical, electronic and/or mechanical equipment repair workshop or on site.

Power generation maintenance personnel are typically trained and authorised to receive permits to work.

No licensing, legislative or certification requirements apply to this unit at the time of publication.

Note: Workplace practice

The application of the skills and knowledge described in this unit of competency may require a licence or training permit to practice in the workplace, where work is carried out on gas and electrical installations. Additional and/or other conditions may apply under state and territory legislative and regulatory licensing requirements.

Pre-requisite Unit

UEENEEI001B Install and set up transducers and sensing devices

UEENEEE102A Fabricate, assemble and dismantle utilities industry components

UEENEEE105A Fix and secure electrotechnology equipment

UEENEEE107A Use drawings, diagrams, schedules, standards, codes and specifications

Competency Field

Maintenance

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Unit Sector

Electricity generation

Elements and Performance Criteria

ELEMENTS	PERFORMANCE CRITERIA
Elements describe the essential outcomes.	Performance criteria describe the performance needed to demonstrate achievement of the element.
1 Plan and prepare for work	**1.1** Requirements including scope of work and assigned roles are identified and confirmed with appropriate personnel or by site inspection, in accordance with workplace procedures
	1.2 Work, Health and Safety (WHS)/Occupational Health and Safety (OHS) regulations, legislative requirements, industry standards, codes of practice, manufacturers' specifications, environmental obligations and workplace procedures are reviewed in preparation for work
	1.3 Resources are obtained and inspected for compliance with job specification
	1.4 Relevant plans, drawings and manuals are selected and used, in accordance with workplace procedures
	1.5 Correct materials and components for work are obtained and inspected, in accordance with workplace procedures, for compliance with job specifications
	1.6 Work is planned, sequenced and prioritised, in accordance with workplace procedures
	1.7 Potential hazards are identified and risk control measures are selected and implemented, in accordance with workplace procedures
	1.8 Work area is prepared, in accordance with workplace and site procedures
2 Carry out instrumentation equipment maintenance	**2.1** Isolations are confirmed, in accordance with workplace procedures and site requirements
	2.2 Instrumentation equipment is maintained, in accordance with workplace procedures, plans, drawings and manuals

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	2.3	Calibration or adjustments are carried out to ensure instrumentation equipment operates within plant parameters, in accordance with workplace procedures
	2.4	Maintenance and calibration adjustments are completed, in accordance with workplace procedures, without damage or unnecessary loss to other equipment
	2.5	Final inspection is carried out, in accordance with workplace procedures
3 Complete work	**3.1**	Work is completed and appropriate personnel are notified, in accordance with workplace procedures
	3.2	Work area is cleared of waste, cleaned, restored and secured, in accordance with workplace procedures
	3.3	Tools and equipment are cleaned, maintained and stored, in accordance with workplace procedures
	3.4	Work completion details are finalised, in accordance with workplace procedures

Foundation Skills

Foundation skills essential to performance are explicit in the performance criteria of this unit of competency.

Range of Conditions

Range is restricted to essential operating conditions and any other variables essential to the work environment.

Non-essential conditions may be found in the Companion Volume Implementation Guide.

Unit Mapping Information

This unit replaces and is equivalent to UEPMNT356B Maintain instrumentation equipment.

Links

Companion Volume implementation guides are found in VETNet - https://vetnet.gov.au/Pages/TrainingDocs.aspx?q=1715b9fa-e7bd-441c-bb8d-cf22c9c825a8

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Assessment Requirements for UEPMNT356 Maintain instrumentation equipment

Modification History

Release 1. This is the first release of this unit of competency in the UEP Generation Training Package.

Performance Evidence

Evidence required to demonstrate competence in this unit must be relevant to and satisfy all the requirements of the elements, performance criteria and range of conditions on at least two separate occasions and includes:

- applying Work, Health and Safety (WHS)/Occupational Health and Safety (OHS) requirements including:
  - hazard identification
  - risk control measures
  - safe working practices
  - using emergency procedures
- carrying out maintenance on instrumentation equipment
- communicating with personnel
- completing work as per scheduled requirements
- determining permit to work requirements
- identifying and selecting materials
- implementing legislation, industry standards, codes of practice and regulations
- interpreting manufacturers' specifications and manuals
- maintaining instrumentation equipment using maintenance and calibration techniques and procedures
- performing with testing and measurement instruments
- planning for instrumentation equipment maintenance work
- utilising tools and equipment
- working with data analysis techniques and tools

Knowledge Evidence

Evidence required to demonstrate competence in this unit must be relevant to and satisfy all the requirements of the elements, performance criteria and range of conditions and includes knowledge of:

- equipment and materials
- installing electronic instrumentation equipment
- instrument installation practices

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- isolations
- legislation, industry standards, codes of practice and regulations
- maintenance and instrument calibration techniques
- manufacturers' specifications and manuals
- permit to work system
- test and measurement instruments
- types of instrumentation equipment
- typical arrangements of power production plant
- WHS/OHS legislated requirements including:
  - hazard identification
  - risk control measures
  - safe working practices
  - using emergency procedures
- workplace documentation
- workplace policies and procedures

Assessment Conditions

As a minimum, assessors must satisfy applicable regulatory requirements, which include requirements in the Standards for Registered Training Organisations current at the time of assessment.

As a minimum, assessment must satisfy applicable regulatory requirements, which include requirements in the Standards for Registered Training Organisations current at the time of assessment.

Assessment processes and techniques must be appropriate to the language, literacy and numeracy requirements of the work being performed and the needs of the candidate.

Assessment must occur in workplace operational situations. Where this is not appropriate, assessment must occur in simulated workplace operational situations that reflect workplace conditions. Resources for assessment must include access to:

- a range of relevant exercises, case studies and/or other simulations
- relevant and appropriate materials, tools, equipment and personal protective equipment currently used in industry
- applicable documentation including workplace procedures, industry standards, equipment specifications, regulations, codes of practice and operation manuals.

Links

Companion Volume implementation guides are found in VETNet - https://vetnet.gov.au/Pages/TrainingDocs.aspx?q=1715b9fa-e7bd-441c-bb8d-cf22c9c825a8

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UEPMNT357 Diagnose and repair faults in instrumentation equipment

Modification History

Release 1. This is the first release of this unit of competency in the UEP Generation Training Package.

Application

This unit involves the skills and knowledge required to diagnose and repair instrumentation equipment, including, but not limited to, sensor elements, signal characterising equipment, input and output blocks, controllers, transducers and final elements.

A fault is defined as an abnormal condition or defect at the component, equipment or system level which may lead to a failure. Diagnosing and repairing faults ensures the smooth and efficient operation of all instrumentation equipment in a power generation facility.

Competency in this unit requires the ability to plan work, find and verify instrumentation equipment faults, determine cause and then repair faults in instrumentation equipment and to report on all completed work tasks. Individuals will, in general, work under supervision in an electrical, electronic and/or mechanical equipment repair workshop or on site.

Power generation maintenance personnel are typically trained and authorised to receive permits to work.

No licensing, legislative or certification requirements apply to this unit at the time of publication.

Note: Workplace practice

The application of the skills and knowledge described in this unit of competency may require a licence or training permit to practice in the workplace, where work is carried out on gas and electrical installations. Additional and/or other conditions may apply under state and territory legislative and regulatory licensing requirements.

Pre-requisite Unit

UEENEEI001B Install and set up transducers and sensing devices

UEENEEE102A Fabricate, assemble and dismantle utilities industry components

UEENEEE105A Fix and secure electrotechnology equipment

UEENEEE107A Use drawings, diagrams, schedules, standards, codes and specifications

Competency Field

Maintenance

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Unit Sector

Electricity generation

Elements and Performance Criteria

ELEMENTS	PERFORMANCE CRITERIA
Elements describe the essential outcomes.	Performance criteria describe the performance needed to demonstrate achievement of the element.
1 Plan and prepare for work	**1.1** Requirements including scope of work and assigned roles are identified and confirmed with appropriate personnel or by site inspection, in accordance with workplace procedures
	1.2 Work, Health and Safety (WHS)/Occupational Health and Safety (OHS) regulations, legislative requirements, industry standards, codes of practice, manufacturers' specifications, environmental obligations and workplace procedures are reviewed in preparation for work
	1.3 Resources are obtained and inspected for compliance, in accordance with workplace procedures and job specification
	1.4 Relevant plans, drawings and manuals are selected and used, in accordance with workplace procedures
	1.5 Correct materials and components for work are obtained and inspected, in accordance with workplace procedures, for compliance with job specification
	1.6 Work is planned, sequenced and prioritised, in accordance with workplace procedures
	1.7 Potential hazards are identified and risk control measures are selected and implemented, in accordance with workplace procedures
	1.8 Work area is prepared, in accordance with workplace and site procedures
2 Diagnose and verify faults	**2.1** Normal performance and function of instrumentation equipment is ascertained using manufacturers' manuals and industry standards, in accordance with workplace procedures

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	2.2	Fault indicators, technical information and diagnostic techniques are used to verify reported faults, in accordance with workplace procedures
	2.3	Faults are reproduced and monitored, in accordance with workplace procedures
3 Find faults	**3.1**	Isolations for work are confirmed, where appropriate, in accordance with workplace procedures and site requirements
	3.2	Instrumentation equipment components, wires, cables, terminations and support fixings are inspected for faults, in accordance with workplace procedures
	3.3	Diagnostic techniques are selected and used to determine faults, in accordance with workplace procedures
	3.4	Components are disconnected, to enable accurate test measurements of suspected faulty components without the concern of back feed readings, in accordance with workplace procedures
	3.5	Test and measurement instruments are used, in accordance with workplace procedures, manufacturers' specifications and job requirements
4 Determine cause of faults	**4.1**	Appropriate personnel are consulted on faulty equipment, in accordance with workplace procedures
	4.2	Information from fault indicators and maintenance records are used, in accordance with workplace procedures
	4.3	Conclusions about the nature and cause of the fault are determined from an analysis of the evidence, in accordance with workplace procedures
5 Repair faults	**5.1**	Isolations for work are confirmed, in accordance with workplace procedures and site requirements
	5.2	Faulty components are replaced or repaired, in accordance with manufacturers' specifications and workplace procedures
	5.3	Components disconnected for testing are reconnected, and all terminations are checked to ensure they are electrically and mechanically sound, in accordance with

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		workplace procedures
	5.4	All faults are repaired, in accordance with workplace procedures
	5.5	Final inspection is performed, in accordance with workplace procedures
6 Complete work	**6.1**	Work is completed and appropriate personnel are notified, in accordance with workplace procedures
	6.2	Work area is cleared of waste, cleaned, restored and secured, in accordance with workplace procedures
	6.3	Tools and equipment are cleaned, maintained and stored, in accordance with workplace procedures
	6.4	Work completion details are finalised, in accordance with workplace procedures

Foundation Skills

Foundation skills essential to performance are explicit in the performance criteria of this unit of competency.

Range of Conditions

Range is restricted to essential operating conditions and any other variables essential to the work environment.

Non-essential conditions may be found in the Companion Volume Implementation Guide.

Unit Mapping Information

This unit replaces and is equivalent to UEPMNT357B Diagnose and repair faults in instrumentation equipment.

Links

Companion Volume implementation guides are found in VETNet - https://vetnet.gov.au/Pages/TrainingDocs.aspx?q=1715b9fa-e7bd-441c-bb8d-cf22c9c825a8

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Assessment Requirements for UEPMNT357 Diagnose and repair faults in instrumentation equipment

Modification History

Release 1. This is the first release of this unit of competency in the UEP Generation Training Package.

Performance Evidence

Evidence required to demonstrate competence in this unit must be relevant to and satisfy all the requirements of the elements, performance criteria and range of conditions on at least two separate occasions and includes:

- applying Work, Health and Safety (WHS)/Occupational Health and Safety (OHS) requirements including:
  - emergency procedures
  - hazard identification
  - risk control measures
  - safe working practices
- communicating with personnel
- completing work as per scheduled requirements
- determining cause of instrumentation equipment fault
- determining permit to work requirements
- diagnosing and repairing faults in instrumentation equipment
- finding instrumentation equipment fault using fault finding and diagnostic techniques
- identifying and selecting materials
- implementing regulations, legislation, industry standards and codes of practice
- interpreting manufacturers' specifications and manuals
- planning for diagnosis and fault repair of instrumentation equipment work
- repairing instrumentation equipment fault
- using tools and equipment
- verifying instrumentation equipment fault using data analysis techniques and tools
- working with test and measurement instruments

Knowledge Evidence

Evidence required to demonstrate competence in this unit must be relevant to and satisfy all the requirements of the elements, performance criteria and range of conditions and includes knowledge of:

- diagnosing and repairing faults in instrumentation equipment

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- diagnostic and fault finding techniques and procedures
- equipment and materials
- instrument calibration techniques
- instrumentation equipment
- isolations
- legislation, industry standards, codes of practice and regulations
- manufacturers' specifications and manuals
- permit to work system
- plant and equipment and its location
- repair and verification techniques
- test and measurement instruments
- typical arrangements of power production plant
- WHS/OHS legislated requirements including:
  - emergency procedures
  - hazard identification
  - risk control measures
  - safe working practices
- workplace documentation
- workplace policies and procedures

Assessment Conditions

As a minimum, assessors must satisfy applicable regulatory requirements, which include requirements in the Standards for Registered Training Organisations current at the time of assessment.

As a minimum, assessment must satisfy applicable regulatory requirements, which include requirements in the Standards for Registered Training Organisations current at the time of assessment.

Assessment processes and techniques must be appropriate to the language, literacy and numeracy requirements of the work being performed and the needs of the candidate.

Assessment must occur in workplace operational situations. Where this is not appropriate, assessment must occur in simulated workplace operational situations that reflect workplace conditions. Resources for assessment must include access to:

- a range of relevant exercises, case studies and/or other simulations
- relevant and appropriate materials, tools, equipment and personal protective equipment currently used in industry
- applicable documentation including workplace procedures, industry standards, equipment specifications, regulations, codes of practice and operation manuals.

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Links

Companion Volume implementation guides are found in VETNet - https://vetnet.gov.au/Pages/TrainingDocs.aspx?q=1715b9fa-e7bd-441c-bb8d-cf22c9c825a8

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UEPMNT358 Modify instrumentation equipment

Modification History

Release 1. This is the first release of this unit of competency in the UEP Generation Training Package.

Application

This unit involves the skills and knowledge required to conduct modifications of instrumentation equipment, including but not limited to sensor elements, signal characterising equipment, input and output blocks, controllers, transducers and final elements.

Modifications to instrumentation equipment, that forms part of the control system in a power generation facility, includes any changes which may alter it from the manufacturers' specifications.

Competency in this unit requires the ability to plan work, carry out modifications of instrumentation equipment and to report on all completed work tasks. Individuals will, in general, work under supervision in an electrical, electronic and/or mechanical equipment repair workshop or on site.

Power generation maintenance personnel are typically trained and authorised to receive permits to work.

No licensing, legislative or certification requirements apply to this unit at the time of publication.

Note: Workplace practice

The application of the skills and knowledge described in this unit of competency may require a licence or training permit to practice in the workplace, where work is carried out on gas and electrical installations. Additional and/or other conditions may apply under state and territory legislative and regulatory licensing requirements.

Pre-requisite Unit

UEENEEI001B Install and set up transducers and sensing devices

UEENEEE102A Fabricate, assemble and dismantle utilities industry components

UEENEEE105A Fix and secure electrotechnology equipment

UEENEEE107A Use drawings, diagrams, schedules, standards, codes and specifications

Competency Field

Maintenance

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Unit Sector

Electricity generation

Elements and Performance Criteria

ELEMENTS	PERFORMANCE CRITERIA
Elements describe the essential outcomes.	Performance criteria describe the performance needed to demonstrate achievement of the element.
1 Plan and prepare for work	**1.1** Requirements including scope of work and assigned roles are identified and confirmed with appropriate personnel or by site inspection, in accordance with workplace procedures
	1.2 Work, Health and Safety (WHS)/Occupational Health and Safety OHS) regulations, legislative requirements, industry standards, codes of practice, manufacturers' specifications, environmental obligations and workplace procedures are reviewed in preparation for work
	1.3 Resources are obtained and inspected for compliance with job specification
	1.4 Relevant plans, drawings and manuals are selected and used in accordance with workplace procedures
	1.5 Correct materials and components for work are obtained and inspected, in accordance with workplace procedures, for compliance with job specification
	1.6 Work is planned, sequenced and prioritised, in accordance with workplace procedures
	1.7 Potential hazards are identified and risk control measures are selected and implemented, in accordance with workplace procedures
	1.8 Work area is prepared, in accordance with workplace and site procedures
2 Carry out instrument equipment modifications	**2.1** Isolations are confirmed, in accordance with workplace procedures
	2.2 Instrumentation equipment is modified, in accordance with workplace procedures, plans, drawings and

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		manuals
	2.3	Modifications are completed, in accordance with workplace procedures, and without unnecessary damage or loss to other equipment
	2.4	Modified instrumentation equipment is set up to suit operational requirements, in accordance with workplace procedures and manufacturers' specifications
	2.5	Final inspection is performed, in accordance with workplace procedures
3 Complete work	**3.1**	Work is completed and appropriate personnel are notified in accordance with workplace procedures
	3.2	Work area is cleared of waste, cleaned, restored and secured, in accordance with workplace procedures
	3.3	Tools and equipment are cleaned, maintained and stored, in accordance with workplace procedures
	3.4	Work completion details are finalised, in accordance with workplace procedures

Foundation Skills

Foundation skills essential to performance are explicit in the performance criteria of this unit of competency.

Range of Conditions

Range is restricted to essential operating conditions and any other variables essential to the work environment.

Non-essential conditions may be found in the Companion Volume Implementation Guide.

Unit Mapping Information

This unit replaces and is equivalent to UEPMNT358B Modify instrumentation equipment.

Links

Companion Volume implementation guides are found in VETNet - https://vetnet.gov.au/Pages/TrainingDocs.aspx?q=1715b9fa-e7bd-441c-bb8d-cf22c9c825a8

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Assessment Requirements for UEPMNT358 Modify instrumentation equipment

Modification History

Release 1. This is the first release of this unit of competency in the UEP Generation Training Package.

Performance Evidence

Evidence required to demonstrate competence in this unit must be relevant to and satisfy all the requirements of the elements, performance criteria and range of conditions on at least two separate occasions and includes:

- applying Work, Health and Safety (WHS)/Occupational Health and Safety (OHS) requirements including:
  - emergency procedures
  - hazard identification
  - risk control measures
  - safe working practices
- carrying out modifications of instrumentation equipment using modification techniques and procedures completing work
- communicating with personnel
- determining permit to work requirements
- implementing legislation, industry standards, codes of practice and regulations
- interpreting manufacturers' specification and manuals
- planning for instrumentation equipment modification work
- selecting materials
- using tools and equipment
- working with test and measurement instruments

Knowledge Evidence

Evidence required to demonstrate competence in this unit must be relevant to and satisfy all the requirements of the elements, performance criteria and range of conditions and includes knowledge of:

- equipment and materials
- instrumentation equipment and technology
- isolations
- legislation, industry standards, codes of practice and regulations
- manufacturers' specifications and manuals
- modification techniques

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- modifying instrumentation equipment
- permit to work system
- plant and equipment and its location
- test and measurement instruments
- typical arrangements of power production plant
- WHS/OHS legislated requirements including:
  - emergency procedures
  - hazard identification
  - risk control measures
  - safe working practices
- workplace documentation
- workplace policies and procedures

Assessment Conditions

As a minimum, assessors must satisfy applicable regulatory requirements, which include requirements in the Standards for Registered Training Organisations current at the time of assessment.

As a minimum, assessment must satisfy applicable regulatory requirements, which include requirements in the Standards for Registered Training Organisations current at the time of assessment.

Assessment processes and techniques must be appropriate to the language, literacy and numeracy requirements of the work being performed and the needs of the candidate.

Assessment must occur in workplace operational situations. Where this is not appropriate, assessment must occur in simulated workplace operational situations that reflect workplace conditions. Resources for assessment must include access to:

- a range of relevant exercises, case studies and/or other simulations
- relevant and appropriate materials, tools, equipment and personal protective equipment currently used in industry
- applicable documentation including workplace procedures, industry standards, equipment specifications, regulations, codes of practice and operation manuals.

Links

Companion Volume implementation guides are found in VETNet - https://vetnet.gov.au/Pages/TrainingDocs.aspx?q=1715b9fa-e7bd-441c-bb8d-cf22c9c825a8

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UEPMNT359 Test and commission instrumentation equipment

Modification History

Release 1. This is the first release of this unit of competency in the UEP Generation Training Package.

Application

This unit involves the skills and knowledge required to conduct testing and commissioning of instrumentation equipment including, but not limited to, sensor elements, signal characterising equipment, input and output blocks, controllers, transducers and final elements.

Commissioning and testing is the process of ensuring that all instrumentation equipment, that forms part of the control system in a power generation facility, is working according to operational requirements.

Competency in this unit requires the ability to plan work, testing wiring systems, testing piping and tubing systems, testing instrumentation equipment, commissioning instrumental equipment and to report on all completed work tasks. Individuals will, in general, work under supervision in an electrical, electronic and/or mechanical equipment repair workshop or on site.

Power generation maintenance personnel are typically trained and authorised to receive permits to work.

No licensing, legislative or certification requirements apply to this unit at the time of publication.

Note: Workplace practice

The application of the skills and knowledge described in this unit of competency may require a licence or training permit to practice in the workplace, where work is carried out on gas and electrical installations. Additional and/or other conditions may apply under state and territory legislative and regulatory licensing requirements.

Pre-requisite Unit

UEENEEI001B Install and set up transducers and sensing devices

UEENEEE102A Fabricate, assemble and dismantle utilities industry components

UEENEEE105A Fix and secure electrotechnology equipment

UEENEEE107A Use drawings, diagrams, schedules, standards, codes and specifications

Competency Field

Maintenance

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Unit Sector

Electricity generation

Elements and Performance Criteria

ELEMENTS	PERFORMANCE CRITERIA
Elements describe the essential outcomes.	Performance criteria describe the performance needed to demonstrate achievement of the element.
1 Plan and prepare for work	**1.1** Requirements including scope of work and assigned roles are identified and confirmed with appropriate personnel or by site inspection, in accordance with workplace procedures
	1.2 Work, Health and Safety (WHS)/Occupational Health and Safety (OHS) regulations, legislative requirements, industry standards, codes of practice, manufacturers' specifications, environmental obligations and workplace procedures are reviewed in preparation for work
	1.3 Resources are obtained and inspected for compliance with job specification
	1.4 Relevant plans, drawings and manuals are selected and used, in accordance with workplace procedures
	1.5 Correct materials and components for work are obtained and inspected, in accordance with workplace procedures, for compliance with job specification
	1.6 Work is planned, sequenced and prioritised, in accordance with workplace procedures
	1.7 Potential hazards are identified and risk control measures are selected and implemented, in accordance with workplace procedures
	1.8 Work area is prepared, in accordance with workplace and site procedures
2 Test wiring systems	**2.1** Isolations for work are confirmed, in accordance with workplace procedures and site requirements
	2.2 Wiring systems are tested, in accordance with workplace procedures, plans, drawings and manuals

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	2.3	Wiring systems, including enclosures and supports, are inspected prior to testing, to ensure absence of damage, defect and deterioration, in accordance with workplace procedures
	2. 4	Fixed wiring is tested, as appropriate, in accordance with workplace procedures, and the results are documented to confirm compliance with job specification
3 Test piping and tubing systems	**3.1**	Isolations are confirmed, in accordance with workplace procedures and site requirements
	3.2	Piping and tubing systems are tested, in accordance with workplace procedures, plans, drawings and manuals
	3.3	Piping and tubing systems, including enclosures and supports, are inspected prior to testing, in accordance with workplace procedures, to ensure absence of damage, defects or deterioration
	3.4	Fixed piping and tubing is tested, as appropriate, in accordance with workplace procedures, and results are documented to confirm compliance with job specification
4 Test equipment	**4.1**	Isolations are confirmed, in accordance with workplace procedures and site requirements
	4.2	Instrumentation equipment is tested, in accordance with workplace procedures, plans, drawings and manuals
	4.3	Test conditions are confirmed and the equipment is inspected, in accordance with workplace procedures, to ensure absence of damage, defects and deterioration
	4.4	Instrumentation equipment is tested using appropriate test techniques, in accordance with workplace procedures
	4.5	Instrumentation equipment test results are documented, in accordance with workplace procedures, to confirm compliance with job specification
5 Commission equipment	**5.1**	Isolations are confirmed, in accordance with workplace procedures and site requirements
	5.2	Instrumentation equipment is commissioned, in accordance with workplace procedures, using

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		appropriate plans, drawings and manuals
	5.3	Instrumentation equipment is set up, in accordance with workplace procedures, operational requirements and manufacturers' specifications
	5.4	Testing and monitoring procedures are followed, in accordance with workplace procedures, and results are monitored and documented to ensure equipment operates within job specification
	5.5	Instrumentation equipment is commissioned, in accordance with workplace procedures
	5.6	Final inspection is carried out, in accordance with workplace procedures
6 Complete work	**6.1**	Work is completed and appropriate personnel are notified, in accordance with workplace procedures
	6.2	Work area is cleared of waste, cleaned, restored and secured, in accordance with workplace procedures
	6.3	Tools and equipment are cleaned, maintained and stored, in accordance with workplace procedures
	6.4	Work completion details are finalised, in accordance with workplace procedures

Foundation Skills

Foundation skills essential to performance are explicit in the performance criteria of this unit of competency.

Range of Conditions

Range is restricted to essential operating conditions and any other variables essential to the work environment.

Non-essential conditions may be found in the Companion Volume Implementation Guide.

Unit Mapping Information

This unit replaces and is equivalent to UEPMNT359B Test and commission instrumentation equipment.

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Links

Companion Volume implementation guides are found in VETNet - https://vetnet.gov.au/Pages/TrainingDocs.aspx?q=1715b9fa-e7bd-441c-bb8d-cf22c9c825a8

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Assessment Requirements for UEPMNT359 Test and commission instrumentation equipment

Modification History

Release 1. This is the first release of this unit of competency in the UEP Generation Training Package.

Performance Evidence

Evidence required to demonstrate competence in this unit must be relevant to and satisfy all the requirements of the elements, performance criteria and range of conditions on at least two separate occasions and includes:

- applying Work, Health and Safety (WHS)/Occupational Health and Safety (OHS) requirements including:
  - emergency procedures
  - hazard identification
  - risk control measures
  - safe working practices
- commissioning equipment
- commissioning equipment
- communicating with personnel
- completing work as per scheduled requirements
- determining permit to work system
- implementing legislation, codes of practice, regulations and industry standards
- inspecting, monitoring and testing wiring systems, piping and tubing systems and instrumentation equipment
- interpreting manufacturers' specifications and manuals
- performing with test and measurement instruments
- planning for testing and commissioning instrumentation equipment work
- selecting materials
- testing and commissioning instrumentation equipment using testing techniques
- using tools and equipment
- utilising commissioning techniques and procedures
- working with data analysis techniques and tools

Knowledge Evidence

Evidence required to demonstrate competence in this unit must be relevant to and satisfy all the requirements of the elements, performance criteria and range of conditions and includes knowledge of:

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- equipment and materials
- instrument calibration techniques
- instrumentation systems and operational requirements
- isolations
- legislation, industry standards, codes of practice and regulations
- manufacturers' specifications and manuals
- permit to work system
- plant and equipment and its location
- safe working practices workplace documentation
- test and commission instrumentation equipment
- test and measurement instruments
- testing and commissioning techniques
- typical arrangements of power production plant
- WHS/OHS legislated requirements including:
  - emergency procedures
  - hazard identification
  - risk control measures
- workplace policies and procedures

Assessment Conditions

As a minimum, assessors must satisfy applicable regulatory requirements, which include requirements in the Standards for Registered Training Organisations current at the time of assessment.

As a minimum, assessment must satisfy applicable regulatory requirements, which include requirements in the Standards for Registered Training Organisations current at the time of assessment.

Assessment processes and techniques must be appropriate to the language, literacy and numeracy requirements of the work being performed and the needs of the candidate.

Assessment must occur in workplace operational situations. Where this is not appropriate, assessment must occur in simulated workplace operational situations that reflect workplace conditions. Resources for assessment must include access to:

- a range of relevant exercises, case studies and/or other simulations
- relevant and appropriate materials, tools, equipment and personal protective equipment currently used in industry
- applicable documentation including workplace procedures, industry standards, equipment specifications, regulations, codes of practice and operation manuals.

Links

Companion Volume implementation guides are found in VETNet - https://vetnet.gov.au/Pages/TrainingDocs.aspx?q=1715b9fa-e7bd-441c-bb8d-cf22c9c825a8

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UEPMNT366 Maintain power plant inverter systems

Modification History

Release 1. This is the first release of this unit of competency in the UEP Generation Training Package.

Application

This unit involves the skills and knowledge required to undertake the maintenance of power generation plant inverter systems.

Maintenance includes the regular monitoring, inspection and verification of the safe and efficient operation of a power generation facility's inverter system.

Competency in this unit requires the ability to plan work, carry out inverter system maintenance and complete all work tasks. Individuals will, in general, work under supervision in an electrical, electronic and/or mechanical equipment repair workshop or on site.

No licensing, legislative or certification requirements apply to this unit at the time of publication.

Note: Workplace practices

The application of the skills and knowledge described in this unit of competency may require a licence or training permit to practice in the workplace, where work is carried out on gas and electrical installations. Additional and/or other conditions may apply under state and territory legislative and regulatory licensing requirements.

Pre-requisite Unit

UEENEEG108A Troubleshoot and repair faults in low voltage electrical apparatus and circuits

UEENEEE102A Fabricate, assemble and dismantle utilities industry components

UEENEEE104A Solve problems in D.C. circuits

UEENEEE105A Fix and secure electrotechnology equipment

UEENEEE107A Use drawings, diagrams, schedules, standards, codes and specifications

UEENEEG006A Solve problems in single and three phase low voltage machines

UEENEEG033A Solve problems in single and three phase low voltage electrical apparatus and circuits

UEENEEG063A Arrange circuits, control and protection for general electrical installations

UEENEEG101A Solve problems in electromagnetic devices and related circuits

UEENEEG102A Solve problems in low voltage A.C. circuits

UEENEEG106A Terminate cables, cords and accessories for low voltage circuits

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Competency Field

Maintenance

Unit Sector

Electricity generation

Elements and Performance Criteria

ELEMENTS	PERFORMANCE CRITERIA
Elements describe the essential outcomes.	Performance criteria describe the performance needed to demonstrate achievement of the element.
1 Plan and prepare for work	**1.1** Requirements including scope of work and assigned roles are identified and confirmed with appropriate personnel or by site inspection, in accordance with workplace procedures
	1.2 Work, Health and Safety (WHS)/Occupational Health and Safety (OHS) regulations, legislative requirements, industry standards, codes of practice, manufacturers' specifications, environmental obligations and workplace procedures are reviewed in preparation for work
	1.3 Resources are obtained and inspected for compliance with job specification
	1.4 Relevant plans, drawings and manuals are selected and used, in accordance with workplace procedures
	1.5 Correct materials and components for work are obtained and inspected, in accordance with workplace procedures, for compliance with job specification
	1.6 Work is planned, sequenced and prioritised, in accordance with workplace procedures
	1.7 Potential hazards are identified and risk control measures are selected, in accordance with workplace procedures
	1.8 Work area is prepared, in accordance with workplace procedures
2 Carry out inverter system	**2.1** Isolations are confirmed, where appropriate, in accordance with workplace procedures and site

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maintenance		requirements
	2.2	Inverter system is maintained, in accordance with workplace procedures, plans, drawings and manuals
	2.3	Reset or adjustment is carried out, in accordance with workplace procedures, to ensure inverter system operates within requirements
	2.4	Maintenance, of inverter system is carried out, in accordance with workplace procedures, without damage or loss to other equipment
	2.5	Final inspection is carried out, in accordance with workplace procedures
3 Complete work	**3.1**	Work is completed and appropriate personnel are notified, in accordance with workplace requirements
	3.2	Work area is cleared of waste, cleaned, restored and secured in accordance with workplace procedures
	3.3	Tools and equipment are cleaned, maintained and stored, in accordance with workplace procedures
	3.4	Work completion details are finalised, in accordance with workplace procedures

Foundation Skills

Foundation skills essential to performance are explicit in the performance criteria of this unit of competency.

Range of Conditions

Range is restricted to essential operating conditions and any other variables essential to the work environment.

Non-essential conditions may be found in the Companion Volume Implementation Guide.

Unit Mapping Information

This unit replaces and is equivalent to UEPMNT366A Maintain power plant inverter systems.

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Links

Companion Volume implementation guides are found in VETNet - https://vetnet.gov.au/Pages/TrainingDocs.aspx?q=1715b9fa-e7bd-441c-bb8d-cf22c9c825a8

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Assessment Requirements for UEPMNT366 Maintain power plant inverter systems

Modification History

Release 1. This is the first release of this unit of competency in the UEP Generation Training Package.

Performance Evidence

Evidence required to demonstrate competence in this unit must be relevant to and satisfy all the requirements of the elements, performance criteria and range of conditions on at least two separate occasions and includes:

- applying Work, Health and Safety (WHS)/Occupational Health and Safety (OHS) requirements including:
  - emergency procedures
  - identifying hazards
  - risk control measures
  - safe working practices
- communicating with personnel
- completing work and finalising completion details
- determining permit to work requirements
- implementing legislation, industry standards, codes of practice and regulations
- installation techniques and procedures
- interpreting manufacturers' specifications and manuals
- maintaining power plant inverter systems using maintenance procedures
- planning for power plant inverter system work
- selecting materials and resources
- undertaking isolations

Knowledge Evidence

Evidence required to demonstrate competence in this unit must be relevant to and satisfy all the requirements of the elements, performance criteria and range of conditions and includes knowledge of:

- equipment and materials
- inverter plant and equipment, and its location and operation
- isolations
- legislation, industry standards, codes of practice and regulations
- maintenance of power inverter plant systems

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- maintenance techniques
- manufacturers' specifications and manuals
- permit to work system
- resources and materials
- typical arrangements of power production plant
- WHS/OHS legislated requirements including:
  - emergency procedures
  - potential hazards
  - risk control measures
  - safe working practices
- workplace documentation
- workplace policies and procedures

Assessment Conditions

As a minimum, assessors must satisfy applicable regulatory requirements, which include requirements in the Standards for Registered Training Organisations current at the time of assessment.

As a minimum, assessment must satisfy applicable regulatory requirements, which include requirements in the Standards for Registered Training Organisations current at the time of assessment.

Assessment processes and techniques must be appropriate to the language, literacy and numeracy requirements of the work being performed and the needs of the candidate.

Assessment must occur in workplace operational situations. Where this is not appropriate, assessment must occur in simulated workplace operational situations that reflect workplace conditions. Resources for assessment must include access to:

- a range of relevant exercises, case studies and/or other simulations
- relevant and appropriate materials, tools, equipment and personal protective equipment currently used in industry applicable documentation including workplace procedures, industry standards, equipment specifications, regulations, codes of practice and operation manuals.

Links

Companion Volume implementation guides are found in VETNet - https://vetnet.gov.au/Pages/TrainingDocs.aspx?q=1715b9fa-e7bd-441c-bb8d-cf22c9c825a8

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UEPMNT367 Install and commission stationary gas fuelled reciprocating engines

Modification History

Release 1. This is the first release of this unit of competency in the UEP Generation Training Package.

Application

This unit involves the skills and knowledge required to undertake the installation and commissioning of stationary gas fuelled reciprocating engines.

Installation and commissioning is a key feature of placing stationary gas fuelled reciprocating engines into service. Completing installation and commissioning correctly ensures the reliability of stationary gas fuelled reciprocating engines for its service life.

Competency in this unit requires the ability to work safely to installation standards matching the plant or equipment, location, components and fuel train pipe work relevant to given specifications. Commissioning plant and equipment includes performing precommissioning tests, start ups and adjusting components and controls for safe and efficient operation. It also includes completing all necessary installation and commissioning documentation. Individuals will, in general, work as a maintenance operative, in a power generation facility.

Power generation maintenance personnel are typically trained and authorised to receive permits to work.

No licensing, legislative or certification requirements apply to this unit at the time of publication.

Note: Workplace practices

The application of the skills and knowledge described in this unit of competency may require a licence or training permit to practice in the workplace, where work is carried out on gas and electrical installations. Additional and/or other conditions may apply under state and territory legislative and regulatory licensing requirements.

Pre-requisite Unit

CPCCWHS1001 Work safely in the construction industry

HLTAID001 Provide cardiopulmonary resuscitation.

Competency Field

Maintenance

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Unit Sector

Electricity generation

Elements and Performance Criteria

ELEMENTS	PERFORMANCE CRITERIA
Elements describe the essential outcomes.	Performance criteria describe the performance needed to demonstrate achievement of the element.
1 Prepare to install and commission stationary gas fuelled reciprocating engine	**1.1** Work, Health and Safety (WHS)/Occupational Health and Safety (OHS) regulations are obtained and implemented, in accordance with workplace procedures
	1.2 Health and safety risks are identified and risk control measures are followed, in accordance with workplace procedures
	1.3 Safety hazards that have not previously been identified are noted and risk control measures are implemented, in accordance with workplace procedures
	1.4 Design specification for gas fuelled reciprocating engines to be installed and commissioned are accessed, analysed and confirmed through a detailed site inspection
	1.5 Design specification matters requiring clarification are resolved through liaison with designer and gas authorities
	1.6 Formal authority to proceed with installation and commissioning of stationary gas fuelled reciprocating engine is obtained before commencing work, in accordance with workplace procedures, regulatory and code of practice requirements
	1.7 Installation is prepared and is sequenced, in accordance with workplace procedures and quality assurance requirements
	1.8 Nature and location of the installation and commissioning of the stationary gas fuelled reciprocating engine is determined from documentation or appropriate personnel to establish scope of work and assigned roles to be undertaken

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	1.9 Stationary gas fuelled reciprocating engine plant, equipment component specifications and manufacturers' manuals are obtained
	1.10 Plant, equipment, fuel train pipe work and components are identified and locations are sequenced within the constraints of site and work requirements
	1.11 Materials needed for installation are obtained, in accordance with workplace procedures and design specifications
	1.12 Tools and equipment including personal protective equipment and testing devices are obtained, in accordance with workplace procedures and are checked for correct operation and safety
	1.13 Work area is prepared to support installation and commissioning of gas fuelled reciprocating engine plant and equipment
2 Install stationary gas fuelled reciprocating engine	**2.1** Regulatory and code of practice recording and reporting requirements are satisfied throughout work sequence, in accordance with workplace procedures
	2.2 Gas and electrical circuits, machines and plant are checked as being isolated, in accordance with workplace procedures
	2.3 Stationary gas fuelled reciprocating engine components including fuel train, associated pipe work and flue/exhaust systems are installed, in accordance with workplace procedures, design specifications, technical standards and regulatory requirements
	2.4 Ventilation systems are installed, in accordance with workplace procedures and design specifications
	2.5 Electrical components, wiring enclosures and terminations are installed, in accordance with workplace procedures, design and manufacturers' specifications and regulatory requirements
	2.6 Ongoing compliance and safety inspections of installed gas fuelled reciprocating engine, equipment, pipe work, components and accessories is undertaken and identified defects are rectified
	2.7 Stationary gas fuelled reciprocating engine installation is

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		carried out without waste of materials or damage to plant, equipment, pipe work, components, accessories, the surrounding environment or services using workplace identified sustainable energy principles and practices
	2.8	Unexpected situations are dealt with safely, in accordance with workplace procedures and the approval of authorised personnel
3 Commission stationary gas fuelled reciprocating engine	**3.1**	Gas and electrical safety checks and isolation procedures, including purging are completed and recorded to manufacturers' and regulatory requirements before testing and commissioning are commenced
	3.2	Operational parameters of individual components are tested and adjusted to conform to manufacturers' specifications
	3.3	Reciprocating engine operations are tested, first without, and then with fuel, and adjustments are completed, as required, with results recorded in accordance with workplace procedures and approving authority requirements
	3.4	Exhaust gases are analysed, in accordance with workplace procedures, industry practice and regulatory requirements
	3.5	Commissioning of stationary gas fuelled reciprocating engine is conducted without waste of materials or damage to apparatus and the surrounding environment or services using workplace sustainable energy procedures and practices
4 Completion and report installation and commissioning activities	**4.1**	Final check of installed gas fuelled reciprocating engine is made to verify compliance with regulatory and certification requirements
	4.2	Work area is cleared and materials are disposed of or are recycled, in accordance with legislation and workplace procedures
	4.3	Tools and equipment are cleaned, checked, serviced and stored, in accordance with manufacturers' recommendations and workplace procedures
	4.4	Work site is cleaned and made safe, in accordance with workplace procedures

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4.5	Installed reciprocating engine equipment components, pipe work, flue, exhaust systems and accessories are documented and appropriate personnel are notified, in accordance with workplace procedures

Foundation Skills

Foundation skills essential to performance are explicit in the performance criteria of this unit of competency.

Range of Conditions

Range is restricted to essential operating conditions and any other variables essential to the work environment.

Non-essential conditions may be found in the Companion Volume Implementation Guide.

Unit Mapping Information

This unit replaces and is equivalent to UEPMNT367A Install and commission stationary gas fuelled reciprocating engines.

Links

Companion Volume implementation guides are found in VETNet - https://vetnet.gov.au/Pages/TrainingDocs.aspx?q=1715b9fa-e7bd-441c-bb8d-cf22c9c825a8

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Assessment Requirements for UEPMNT367 Install and commission stationary gas fuelled reciprocating engines

Modification History

Release 1. This is the first release of this unit of competency in the UEP Generation Training Package.

Performance Evidence

Evidence required to demonstrate competence in this unit must be relevant to and satisfy all the requirements of the elements, performance criteria and range of conditions on at least two separate occasions and includes:

- applying Work, Health and Safety (WHS)/Occupational Health and Safety (OHS) requirements including:
  - hazard identification
  - identifying hazards
  - risk control measures
  - safe working practices
- commissioning stationary gas fuelled reciprocating engine
- communicating with personnel
- completing and reporting on installation and commissioning activities
- completing documentation
- determining permit to work requirements
- identifying safety and/or site arrangements including hazardous area requirements
- implementing legislation, industry standards, codes of practice and regulations
- installing stationary gas fuelled reciprocating engine
- interpreting technical and plans drawings related to plant and/or equipment locations and pipe work connections
- obtaining formal authority to proceed with installation and commissioning
- preparing to install and commission stationary gas fuelled reciprocating engines
- recording results from testing
- rectifying defects using tools and equipment
- securing, aligning and connecting plant, equipment, pipe work, components and accessories accurately
- testing pressure, repairing leaks and purging fuel train system to design test pressures
- undertaking compliance and safety inspections
- using manufacturers' specifications and manuals

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Knowledge Evidence

Evidence required to demonstrate competence in this unit must be relevant to and satisfy all the requirements of the elements, performance criteria and range of conditions and includes knowledge of:

- commission and installation processes
- compliance and safety inspections
- documentation and reports
- gas fuelled reciprocating engine types and characteristics
- gas fuels
- legislation, industry standards, codes of practice and regulations
- manufacturers' specifications and manuals
- permit to work system
- potential defects
- pressure testing, repairing leaks and purging fuel train system to design test pressures
- safety and/or site arrangements including hazardous area requirements
- securement, alignment and connection of plant, equipment, pipe work, components and accessories
- stationary gas fuelled reciprocating engine plant and equipment drawings and plans
- tools and equipment
- WHS/OHS legislated requirements including:
  - emergency procedures
  - hazard identification
  - risk control measures
  - safe working practices
- workplace documentation
- workplace policies and procedures

Assessment Conditions

As a minimum, assessors must satisfy applicable regulatory requirements, which include requirements in the Standards for Registered Training Organisations current at the time of assessment.

As a minimum, assessment must satisfy applicable regulatory requirements, which include requirements in the Standards for Registered Training Organisations current at the time of assessment.

Assessment processes and techniques must be appropriate to the language, literacy and numeracy requirements of the work being performed and the needs of the candidate.

Assessment must occur in workplace operational situations. Where this is not appropriate, assessment must occur in simulated workplace operational situations that reflect workplace conditions.

Resources for assessment must include access to:

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- a range of relevant exercises, case studies and/or other simulations
- relevant and appropriate materials, tools, equipment and personal protective equipment currently used in industry
- applicable documentation including workplace procedures, industry standards, equipment specifications, regulations, codes of practice and operation manuals.

Links

Companion Volume implementation guides are found in VETNet - https://vetnet.gov.au/Pages/TrainingDocs.aspx?q=1715b9fa-e7bd-441c-bb8d-cf22c9c825a8

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UEPMNT368 Repair and maintain stationary gas fuelled reciprocating engines

Modification History

Release 1. This is the first release of this unit of competency in the UEP Generation Training Package.

Application

This unit involves the skills and knowledge required to isolate, disconnect, repair, reconnect and undertake maintenance of stationary gas fuelled reciprocating engines. It does not include repairs to the internal mechanical components of the engine.

Maintenance includes the regular monitoring, inspection and verification of the safe and efficient operation of a power generation facility's stationary gas fuelled reciprocating engine.

Competency in this unit requires the ability to work safely to relevant industry standards when disconnecting, carrying out repairs and replacing fuel train components to given specifications. It also includes reconnecting the engine including pre-start tests, start-up, adjusting components and controls for safe and efficient operation and completing all required documentation. Individuals will, in general, work as a maintenance operative, in a power generation facility.

Power generation maintenance personnel are typically trained and authorised to receive permits to work.

No licensing, legislative or certification requirements apply to this unit at the time of publication.

Note: Workplace practices

The application of the skills and knowledge described in this unit of competency may require a licence or training permit to practice in the workplace, where work is carried out on gas and electrical installations. Additional and/or other conditions may apply under state and territory legislative and regulatory licensing requirements.

Pre-requisite Unit

CPCCWHS1001 Work safely in the construction industry

HLTAID001 Provide cardiopulmonary resuscitation

Competency Field

Maintenance

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Unit Sector

Electricity generation

Elements and Performance Criteria

ELEMENTS	PERFORMANCE CRITERIA
Elements describe the essential outcomes.	Performance criteria describe the performance needed to demonstrate achievement of the element.
1 Prepare to repair and maintain gas fuelled reciprocating engines	**1.1** Work, Health and Safety (WHS)/Occupational Health and Safety (OHS) procedures are identified and implemented, in accordance with workplace procedures
	1.2 Health and safety risks are identified and risk control measures are followed, in accordance with workplace procedures
	1.3 Safety hazards that have not previously been identified are noted, and risk control measures are implemented and followed, in accordance with workplace procedures
	1.4 Formal authority to proceed with repair and maintenance work is obtained, in accordance with workplace procedures
	1.5 Repair and maintenance work is sequenced, in accordance with workplace procedures
	1.6 Nature and location of repair and maintenance work is determined from documentation, or appropriate personnel, to establish scope of work and assigned roles
	1.7 Stationary gas fuelled reciprocating engine plant, equipment and component specifications and manufacturers' manuals are obtained
	1.8 Material needed for repair and maintenance work is obtained, in accordance with workplace procedures and is checked against job requirements
	1.9 Tools and equipment, including personal protective equipment and testing devices are obtained, in accordance with workplace procedures and are checked for correct operation and safety
2 Repair and maintain gas fuelled reciprocating	**2.1** Regulatory and code of practice recording and reporting requirements are completed, in accordance with

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engines		workplace procedures
	2.2	Gas and electrical circuits, machines and/or power generation plant are checked prior to commencement and are recorded as being isolated and safe, in accordance with workplace procedures
	2.3	Nature and possible cause of stationary gas fuelled reciprocating engine faults, or out of specification performance, are identified from defect reports or operational records
	2.4	Fault finding using observation, measurement, calculations, comparison with normal system and component parameter values is undertaken
	2.5	Faults beyond the scope of gas fuel train, ignition or fume exhaust work are identified and arrangements are made for authorised personnel to rectify faults
	2.6	Stationary gas fuelled reciprocating engine is disconnected, to carry out maintenance and repairs, in accordance with workplace procedures
	2.7	Components are removed or dismantled, where necessary, and parts are stored to protect them against loss or damage
	2.8	Faulty components are rechecked and their fault status is reconfirmed
	2.9	Materials required to rectify faults are obtained, in accordance with workplace procedures
	2.10	Repair and maintenance work is carried out without waste of materials or damage to apparatus, circuits, the surrounding environment or services, in accordance with workplace procedures and sustainable energy principles and practices
	2.11	Stationary gas fuelled reciprocating engine repair is tested, in accordance with workplace procedures
	2.12	Stationary gas fuelled reciprocating engine is reassembled, reconnected and tested to ensure it is operating safely and that it complies with relevant workplace and legislative requirements
3 Complete and report on	**3.1**	Final check of stationary gas fuelled reciprocating engine is made to verify compliance with legislative and

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repair and maintenance		certification requirements
	3.2	Work area is cleared and materials are disposed of or recycled, in accordance with workplace procedures
	3.3	Tools and equipment are cleaned, checked, serviced and stored, in accordance with manufacturers' recommendations and workplace procedures
	3.4	Work site is cleaned and made safe, in accordance with workplace procedures
	3.5	Maintenance and repair work is documented and appropriate personnel are notified, in accordance with workplace procedures

Foundation Skills

Foundation skills essential to performance are explicit in the performance criteria of this unit of competency.

Range of Conditions

Range is restricted to essential operating conditions and any other variables essential to the work environment.

Non-essential conditions may be found in the Companion Volume Implementation Guide.

Unit Mapping Information

This unit replaces and is equivalent to UEPMNT368A Repair and maintain stationary gas fuelled reciprocating engines.

Links

Companion Volume implementation guides are found in VETNet - https://vetnet.gov.au/Pages/TrainingDocs.aspx?q=1715b9fa-e7bd-441c-bb8d-cf22c9c825a8

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Assessment Requirements for UEPMNT368 Repair and maintain stationary gas fuelled reciprocating engines

Modification History

Release 1. This is the first release of this unit of competency in the UEP Generation Training Package.

Performance Evidence

Evidence required to demonstrate competence in this unit must be relevant to and satisfy all the requirements of the elements, performance criteria and range of conditions on at least two separate occasions and includes:

- applying Work, Health and Safety (WHS)/Occupational Health and Safety (OHS) requirements including:
  - emergency procedures
  - hazard identification
  - risk control measures
- communicating with personnel
- determining permit to work requirements
- disconnecting and reconnecting stationary gas fuelled reciprocating engine
- finding and rectifying faults
- preparing to repair and maintain stationary gas fuelled reciprocating engines
- repairing and maintaining stationary gas fuelled reciprocating engines including identifying faults completing and reporting on repair and maintenance work
- safe working practices implementing legislation, industry standards, codes of practice and regulations
- using manufacturers' specifications and manuals
- working with sustainable energy principles and practices

Knowledge Evidence

Evidence required to demonstrate competence in this unit must be relevant to and satisfy all the requirements of the elements, performance criteria and range of conditions and includes knowledge of:

- documentation and report requirements
- fault finding
- gas fuelled reciprocating engines
- gas fuels
- legislation, industry standards, codes of practice and regulations
- manufacturers' specifications and manuals

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- permit to work system
- reconnection and disconnection of stationary gas fuelled reciprocating engines
- stationary gas fuelled reciprocating engine repair and maintenance
- sustainable energy principles and practices
- WHS/OHS legislated requirements including:
  - emergency procedures
  - hazard identification
  - risk control measures
  - safe working practices
- workplace documentation
- workplace policies and procedures

Assessment Conditions

As a minimum, assessors must satisfy applicable regulatory requirements, which include requirements in the Standards for Registered Training Organisations current at the time of assessment.

As a minimum, assessment must satisfy applicable regulatory requirements, which include requirements in the Standards for Registered Training Organisations current at the time of assessment.

Assessment processes and techniques must be appropriate to the language, literacy and numeracy requirements of the work being performed and the needs of the candidate.

Assessment must occur in workplace operational situations. Where this is not appropriate, assessment must occur in simulated workplace operational situations that reflect workplace conditions.

Resources for assessment must include access to:

- a range of relevant exercises, case studies and/or other simulations
- relevant and appropriate materials, tools, equipment and personal protective equipment currently used in industry
- applicable documentation including workplace procedures, industry standards, equipment specifications, regulations, codes of practice and operation manuals.

Links

Companion Volume implementation guides are found in VETNet - https://vetnet.gov.au/Pages/TrainingDocs.aspx?q=1715b9fa-e7bd-441c-bb8d-cf22c9c825a8

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UEPMNT369 Monitor climatic conditions for renewable electricity generation

Modification History

Release 1. This is the first release of this unit of competency in the UEP Generation Training Package.

Application

This unit involves the skills and knowledge required to monitor weather and climate conditions for the purposes of planning electricity generation from renewable sources and ensuring the safety of power generation plant and personnel.

Weather is measured through the assessment of patterns in temperature, humidity, atmospheric pressure, wind, precipitation and other meteorological variables. Climate is the measurement of weather over longer periods of time in specific regions.

Competency in this unit requires the ability to interpret weather and climate information, plan for adverse or extreme weather conditions, take action in response to adverse or extreme weather conditions and complete all documentation. Individuals will, in general, work as a maintenance operative in a power generation facility.

No licensing, legislative or certification requirements apply to this unit at the time of publication.

Note: Workplace practices

The application of the skills and knowledge described in this unit of competency may require a licence or training permit to practice in the workplace, where work is carried out on gas and electrical installations. Additional and/or other conditions may apply under state and territory legislative and regulatory licensing requirements.

Pre-requisite Unit

There are no prerequisite units.

Competency Field

Maintenance

Unit Sector

Electricity generation

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Elements and Performance Criteria

ELEMENTS	PERFORMANCE CRITERIA
Elements describe the essential outcomes.	Performance criteria describe the performance needed to demonstrate achievement of the element.
1 Interpret weather and climate information	**1.1** Weather, climate information and warnings are regularly monitored to determine likely conditions
	1.2 Potential variations in weather and climate conditions are assessed, in accordance with warnings, weather patterns and historical experience
	1.3 Possible impact of weather and climate on power generation plant, equipment, grid demand and civil assets are identified
2 Plan for adverse weather conditions	**2.1** Workplace operational guidelines for adverse weather conditions are accessed and implemented, in accordance with workplace procedures
	2.2 Possible power generation outages and actions to be taken are communicated to key stakeholders
3 Act in response to adverse weather conditions	**3.1** Work schedules are adjusted, in accordance with workplace procedures, to account for extreme weather events
	3.2 Workplace procedures to be followed during, and after, extreme weather events are analysed and discussed with personnel or team members
	3.3 External assets in the perimeter area of wind turbine generators are prepared, in accordance with workplace procedures, for extreme weather events
	3.4 Emergency and evacuation procedures are implemented, in accordance with workplace procedures for adverse weather conditions
	3.5 Stakeholders and key personnel are informed of anticipated impact of weather and climate on power generation plant, equipment, grid demand and civil assets
	3.6 Meteorological incidents are monitored and preventative actions are taken

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	3.7	Normal operations are recommenced, in accordance with workplace procedures, after confirmation of return to normal weather conditions and completion of inspection
4 Complete documentation	**4.1**	Workplace documentation is updated, in accordance with workplace procedures
	4.2	Reports are prepared and presented to key personnel, in accordance with workplace procedures

Foundation Skills

Foundation skills essential to performance are explicit in the performance criteria of this unit of competency.

Range of Conditions

Range is restricted to essential operating conditions and any other variables essential to the work environment.

Non-essential conditions may be found in the Companion Volume Implementation Guide.

Unit Mapping Information

This unit replaces and is equivalent to UEPMNT369A Monitor climatic conditions for renewable electricity generation

Links

Companion Volume implementation guides are found in VETNet - https://vetnet.gov.au/Pages/TrainingDocs.aspx?q=1715b9fa-e7bd-441c-bb8d-cf22c9c825a8

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Assessment Requirements for UEPMNT369 Monitor climatic conditions for renewable electricity generation

Modification History

Release 1. This is the first release of this unit of competency in the UEP Generation Training Package.

Performance Evidence

Evidence required to demonstrate competence in this unit must be relevant to and satisfy all the requirements of the elements, performance criteria and range of conditions on at least two separate occasions and includes:

- accessing weather data from monitoring systems
- acting in response to adverse or extreme weather conditions
- applying Work, Health and Safety (WHS)/Occupational Health and Safety (OHS) requirements including:
  - emergency procedures
  - hazard identification
  - risk control measures
  - safe working practices
- assessing wind speed, wind direction, atmospheric pressure and lightning strike geographical data
- communicating with personnel
- completing documentation
- implementing legislation, industry standards, codes of practice and regulations
- interpreting weather and climate information
- planning for adverse or extreme weather conditions
- preparing documentation
- undertaking post weather event damage inspections
- using manufacturers' specifications and manuals

Knowledge Evidence

Evidence required to demonstrate competence in this unit must be relevant to and satisfy all the requirements of the elements, performance criteria and range of conditions and includes knowledge of:

- documentation and reporting requirements
- legislation, industry standards, codes of practice and regulations
- manufacturers' specifications and manuals
- meteorology

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- post weather event damage inspections
- risk mitigation processes
- weather data monitoring systems
- weather safety alert systems
- WHS/OHS legislated requirements including:
  - emergency procedures
  - hazard identification
  - risk control measures
  - safe working practices
- workplace documentation
- workplace policies and procedures

Assessment Conditions

As a minimum, assessors must satisfy applicable regulatory requirements, which include requirements in the Standards for Registered Training Organisations current at the time of assessment.

As a minimum, assessment must satisfy applicable regulatory requirements, which include requirements in the Standards for Registered Training Organisations current at the time of assessment.

Assessment processes and techniques must be appropriate to the language, literacy and numeracy requirements of the work being performed and the needs of the candidate.

Assessment must occur in workplace operational situations. Where this is not appropriate, assessment must occur in simulated workplace operational situations that reflect workplace conditions.

Resources for assessment must include access to:

- a range of relevant exercises, case studies and/or other simulations
- relevant and appropriate materials, tools, equipment and personal protective equipment currently used in industry
- applicable documentation including workplace procedures, industry standards, equipment specifications, regulations, codes of practice and operation manuals.

Links

Companion Volume implementation guides are found in VETNet - https://vetnet.gov.au/Pages/TrainingDocs.aspx?q=1715b9fa-e7bd-441c-bb8d-cf22c9c825a8

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UEPMNT370 Maintain and monitor wind farm civil assets

Modification History

Release 1. This is the first release of this unit of competency in the UEP Generation Training Package.

Application

This unit involves the skills and knowledge required to condition, monitor and conduct preventative and remedial maintenance to ensure the integrity of civil assets associated with a wind farm.

Civil assets include infrastructure such as water treatment facilities, sewer pipelines, roads, utility grids, bridges, tunnels and railways. Maintenance involves the use of strategies and procedures to preserve and extend the service life of civil asset infrastructure at a wind farm.

Competency in this unit requires the ability to plan work, disassemble wind turbine, inspect wind turbine components, repair wind turbine and/or components and report on all completed work tasks. Individuals will, in general, work under supervision in a maintenance operative in a power generation facility.

Power generation maintenance personnel are typically trained and authorised to receive permits to work.

No licensing, legislative or certification requirements apply to this unit at the time of publication.

Note: Workplace practice

The application of the skills and knowledge described in this unit of competency may require a licence or training permit to practice in the workplace, where work is carried out on gas and electrical installations. Additional and/or other conditions may apply under state and territory legislative and regulatory licensing requirements.

Pre-requisite Unit

UEENEEK142A Apply environmental and sustainable procedures in the energy sector

UEENEEE102A Fabricate, assemble and dismantle utilities industry components

Competency Field

Maintenance

Unit Sector

Electricity generation

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Elements and Performance Criteria

ELEMENTS	PERFORMANCE CRITERIA
Elements describe the essential outcomes.	Performance criteria describe the performance needed to demonstrate achievement of the element.
1 Plan and prepare for the work	**1.1** Work, Health and Safety (WHS)/Occupational Health and Safety (OHS) regulations, legislative requirements, industry standards, codes of practice, manufacturers' specifications, environmental obligations and workplace procedures are reviewed in preparation for work
	1.2 Requirements including scope of work and assigned roles are identified and confirmed with appropriate personnel or by site inspection, in accordance with workplace procedures
	1.3 Resources are obtained and inspected for compliance, in accordance with workplace procedures
	1.4 Potential hazards are identified and risk control measures are selected and implemented, in accordance with workplace procedures
	1.5 Work is planned sequenced and prioritised, in accordance with workplace procedures
2 Monitor civil assets	**2.1** Inspection of civil assets is completed, in accordance with workplace procedures
	2.2 Inspection results are reported, in accordance with workplace procedures
	2.3 Defects are reported, in accordance with workplace procedures
3 Maintain civil assets	**3.1** Maintenance work on civil assets is undertaken, in accordance with workplace procedures and site requirements
	3.2 Tools and equipment to maintain civil assets are utilised, in accordance with manufacturers' specifications and job requirements.
	3.3 Defects are repaired, in accordance with workplace procedures

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4 Complete work	**4.1** Work is completed and appropriate personnel are notified, in accordance with workplace procedures
	4.2 Work area is cleared of waste, cleaned, restored and secured, in accordance with workplace procedures
	4.3 Tools and equipment are maintained, in accordance with manufacturers' specifications and workplace procedures
	4.4 Work completion details are finalised, in accordance with workplace procedures

Foundation Skills

Foundation skills essential to performance are explicit in the performance criteria of this unit of competency.

Range of Conditions

Range is restricted to essential operating conditions and any other variables essential to the work environment.

Non-essential conditions may be found in the Companion Volume Implementation Guide.

Unit Mapping Information

This unit replaces and is equivalent to UEPMNT370A Maintain and monitor wind farm civil assets.

Links

Companion Volume implementation guides are found in VETNet - https://vetnet.gov.au/Pages/TrainingDocs.aspx?q=1715b9fa-e7bd-441c-bb8d-cf22c9c825a8

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Assessment Requirements for UEPMNT370 Maintain and monitor wind farm civil assets

Modification History

Release 1. This is the first release of this unit of competency in the UEP Generation Training Package.

Performance Evidence

Evidence required to demonstrate competence in this unit must be relevant to and satisfy all the requirements of the elements, performance criteria and range of conditions on at least two separate occasions and includes:

- applying Work, Health and Safety (WHS)/Occupational Health and Safety (OHS) requirements including:
  - emergency procedures
  - hazard identification
  - risk control measures
  - safe working practices
- communicating with personnel
- completing work
- confirming security systems operation
- implementing legislation, industry standards, codes of practice and regulations
- interpreting manufacturers' specifications and manuals
- maintaining and repairing civil assets including:
  - confirming security system operation
  - performing corrosion restoration and painting of metal surfaces
  - placing pest control baits in a safe and environmentally aware manner
  - undertaking surveys of lighting systems and replacing defective bulbs
  - using brush cutters and mowers to reduce vegetation form the perimeter of buildings and/or structures
- monitoring civil assets
- performing corrosion restoration and painting of metal surfaces
- placing pest control baits in a safe and environmentally aware manner
- planning for maintenance and monitoring of wind farm civil assets work
- undertaking surveys of lighting systems and replacing defective bulbs
- using brush cutters and mowers to reduce vegetation from the perimeter of buildings or structures
  -

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Knowledge Evidence

Evidence required to demonstrate competence in this unit must be relevant to and satisfy all the requirements of the elements, performance criteria and range of conditions and includes knowledge of:

- civil asset monitoring including paint work, corrosion, pests, vegetation and erosion
- civil assets including fences, gates, roads, pathways, security system and lights
- inspection methods and techniques
- legislation, industry standards, codes of practice and regulations
- maintenance methods and techniques
- manufacturers' specifications and manuals
- repair methods and techniques
- WHS/OHS legislated requirements including:
  - emergency procedures
  - hazard identification
  - risk control measures
  - safe working practices
- workplace documentation
- workplace policies and procedures

Assessment Conditions

As a minimum, assessors must satisfy applicable regulatory requirements, which include requirements in the Standards for Registered Training Organisations current at the time of assessment.

As a minimum, assessment must satisfy applicable regulatory requirements, which include requirements in the Standards for Registered Training Organisations current at the time of assessment.

Assessment processes and techniques must be appropriate to the language, literacy and numeracy requirements of the work being performed and the needs of the candidate.

Assessment must occur in workplace operational situations. Where this is not appropriate, assessment must occur in simulated workplace operational situations that reflect workplace conditions.

Resources for assessment must include access to:

- a range of relevant exercises, case studies and/or other simulations
- relevant and appropriate materials, tools, equipment and personal protective equipment currently used in industry
- applicable documentation including workplace procedures, industry standards, equipment specifications, regulations, codes of practice and operation manuals.

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UEPMNT371 Maintain large scale wind turbine generators

Modification History

Release 1. This is the first release of this unit of competency in the UEP Generation Training Package.

Application

This unit involves the skills and knowledge required to undertake scheduled maintenance of large scale wind turbine generators.

Scheduled maintenance typically includes a list of predetermined maintenance actions carried out at regular time intervals to prevent breakdowns. It includes monitoring, inspecting and maintaining large scale wind turbine generators to ensure their safe and efficient operation.

Competency in this unit requires the ability to plan work, conduct maintenance and complete all work tasks. Individuals will, in general, work under supervision in an electrical, electronic and/or mechanical equipment repair workshop or on site.

Power generation maintenance personnel are typically trained and authorised to receive permits to work.

No licensing, legislative or certification requirements apply to this unit at the time of publication.

Note: Workplace practice

The application of the skills and knowledge described in this unit of competency may require a licence or training permit to practice in the workplace, where work is carried out on gas and electrical installations. Additional and/or other conditions may apply under state and territory legislative and regulatory licensing requirements.

Pre-requisite Unit

There are no prerequisite units.

Competency Field

Maintenance

Unit Sector

Electricity generation

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Elements and Performance Criteria

ELEMENTS	PERFORMANCE CRITERIA
Elements describe the essential outcomes.	Performance criteria describe the performance needed to demonstrate achievement of the element.
1 Plan and prepare for work	**1.1** Requirements including scope of work and assigned roles are identified and confirmed with appropriate personnel or by site inspection, in accordance with workplace procedures
	1.2 Work, Health and Safety (WHS)/Occupational Health and Safety (OHS) regulations, legislative requirements, industry standards, codes of practice, manufacturers' specifications, environmental obligations and workplace procedures are reviewed in preparation for work
	1.3 Resources are obtained and inspected for compliance with job specification
	1.4 Relevant plans, drawings and manuals are selected and used, in accordance with workplace procedures
	1.5 Work is planned, sequenced and prioritised, in accordance with workplace procedures
	1.6 Isolations for work are requested, in accordance with workplace procedures
	1.7 Work area is prepared, in accordance with workplace procedures
2 Conduct maintenance	**2.1** Wind turbine generator equipment is replaced, in accordance with manufacturers' specifications and workplace procedures
	2.2 Documented service checklists, or similar documentation, are followed, in accordance with workplace procedures
	2.3 Diagnostic testing and data from monitoring systems are used to identify wind turbine generator components requiring maintenance
	2.4 Wind turbine generator equipment is dismantled for maintenance, in accordance with manufacturers' specifications and workplace procedures

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	2.5	Approved workplace techniques are used to enable identification or reassembly of components or equipment, in accordance with workplace procedures
	2.6	New components are obtained and inspected, in accordance with workplace procedures, for compliance with manufacturers' specifications
	2.7	Wind turbine generator equipment or components are tested, monitored and adjusted, in accordance with manufacturers' specifications and workplace procedures
3 Complete work	**3.1**	Work is completed and appropriate personnel are notified, in accordance with workplace procedures
	3.2	Work area is cleared of waste, cleaned, restored and secured, in accordance with workplace procedures
	3.3	Tools and equipment are maintained and stored, in accordance with workplace procedures
	3.4	Maintenance completion details are finalised, in accordance with workplace procedures

Foundation Skills

Foundation skills essential to performance are explicit in the performance criteria of this unit of competency.

Range of Conditions

Range is restricted to essential operating conditions and any other variables essential to the work environment.

Non-essential conditions may be found in the Companion Volume Implementation Guide.

Unit Mapping Information

This unit replaces and is equivalent to UEPMNT371A Maintain large scale wind turbine generators.

Links

Companion Volume implementation guides are found in VETNet - https://vetnet.gov.au/Pages/TrainingDocs.aspx?q=1715b9fa-e7bd-441c-bb8d-cf22c9c825a8

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Assessment Requirements for UEPMNT371 Maintain large scale wind turbine generators

Modification History

Release 1. This is the first release of this unit of competency in the UEP Generation Training Package.

Performance Evidence

Evidence required to demonstrate competence in this unit must be relevant to and satisfy all the requirements of the elements, performance criteria and range of conditions on at least two separate occasions and includes:

- applying Work, Health and Safety (WHS)/Occupational Health and Safety (OHS) requirements including:
  - emergency procedures
  - hazard identification
  - risk control measures
  - safe working practices including working in high wind velocity
- assembling and dismantling wind turbine generator equipment and components
- communicating with personnel
- completing documentation after maintenance activities
- completing work as per scheduled requirements
- conducting diagnostic testing using which may include use of a diagnostic computer
- conducting maintenance
- determining permit to work requirements
- identifying faults in wind turbine generator equipment and components
- implementing legislation, industry standards, codes of practice and regulations
- interpreting data
- planning for maintenance of large scale wind turbine generator work
- reading maintenance schedules and service checklists
- using manufacturers' specifications and manuals

Knowledge Evidence

Evidence required to demonstrate competence in this unit must be relevant to and satisfy all the requirements of the elements, performance criteria and range of conditions and includes knowledge of:

- legislation, industry standards, codes of practice and regulations
- manufacturers' specifications and manuals

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- permit to work system
- safe working practices including working in high wind velocity
- typical arrangements of, power production plant
- WHS/OHS legislated requirements including:
  - emergency procedures
  - hazard identification
  - risk control measures
- wind turbine generator plant and equipment, its location and operating parameters
- wind turbine generator plant status
- wind turbine generator, types and characteristics
- workplace documentation
- workplace policies and procedures

Assessment Conditions

As a minimum, assessors must satisfy applicable regulatory requirements, which include requirements in the Standards for Registered Training Organisations current at the time of assessment.

As a minimum, assessment must satisfy applicable regulatory requirements, which include requirements in the Standards for Registered Training Organisations current at the time of assessment.

Assessment processes and techniques must be appropriate to the language, literacy and numeracy requirements of the work being performed and the needs of the candidate.

Assessment must occur in workplace operational situations. Where this is not appropriate, assessment must occur in simulated workplace operational situations that reflect workplace conditions.

Resources for assessment must include access to:

- a range of relevant exercises, case studies and/or other simulations
- relevant and appropriate materials, tools, equipment and personal protective equipment currently used in industry
- applicable documentation including workplace procedures, industry standards, equipment specifications, regulations, codes of practice and operation manuals.

Links

Companion Volume implementation guides are found in VETNet - https://vetnet.gov.au/Pages/TrainingDocs.aspx?q=1715b9fa-e7bd-441c-bb8d-cf22c9c825a8

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UEPMNT401 Install and maintain complex mechanical seals

Modification History

Release 1. This is the first release of this unit of competency in the UEP Generation Training Package.

Application

This unit involves the skills and knowledge required to undertake the installation and maintenance of complex mechanical seals which may involve fault finding, diagnosis and repair.

Installation of mechanical seals, which are leakage control devices used in power generation plant and equipment, is typically performed in conjunction with manufacturers' specifications to ensure serviceability and reliability. Maintenance ensures the ongoing care and upkeep of the seals to ensure optimal efficiency.

Competency in this unit requires the ability to plan work, remove complex mechanical seals for maintenance, maintain complex mechanical seals, replace and/or install complex mechanical seals and to report on all completed work tasks. Individuals will, in general, work under supervision in an electrical, electronic and/or mechanical equipment repair workshop or on site.

Power generation maintenance personnel are typically trained and authorised to receive permits to work.

No licensing, legislative or certification requirements apply to this unit at the time of publication.

Note: Workplace practice

The application of the skills and knowledge described in this unit of competency may require a licence or training permit to practice in the workplace, where work is carried out on gas and electrical installations. Additional and/or other conditions may apply under state and territory legislative and regulatory licensing requirements.

Pre-requisite Unit

UEPMNT304 Maintain mechanical pumps

MEM18006C Repair and fit engineering components

MEM09002B Interpret technical drawing

MEM12023A Perform engineering measurements

MEM18001C Use hand tools

MEM18002B Use power tools/hand held operations

MEM18003C Use tools for precision work

MEM18055B Dismantle, replace and assemble engineering components

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Competency Field

Maintenance

Unit Sector

Electricity generation

Elements and Performance Criteria

ELEMENTS	PERFORMANCE CRITERIA
Elements describe the essential outcomes.	Performance criteria describe the performance needed to demonstrate achievement of the element.
1 Plan and prepare for work	**1.1** Requirements including scope of work and assigned roles are identified and confirmed with appropriate personnel or by site inspection, in accordance with workplace procedures
	1.2 Work, Health and Safety (WHS)/Occupational Health and Safety (OHS) regulations, legislative requirements, industry standards, codes of practice, manufacturers' specifications, environmental obligations and workplace procedures are reviewed in preparation for work
	1.3 Resources are obtained and inspected for compliance with job specification
	1.4 Relevant plans, drawings and manuals are selected and used, in accordance with workplace procedures
	1.5 Correct materials and components for work are obtained and inspected, in accordance with workplace procedures, for compliance with job specification
	1.6 Work is planned, sequenced and prioritised, in accordance with workplace procedures
	1.7 Potential hazards are identified, and risk control measures are selected and implemented, in accordance with workplace procedures
	1.8 Work area is prepared, in accordance with workplace and site procedures
2 Remove complex mechanical seals for	**2.1** Isolations for work are confirmed, in accordance with

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maintenance		workplace procedures
	2.2	Complex mechanical seals are identified, in accordance with workplace procedures
	2.3	Complex mechanical seals are removed, in accordance with workplace procedures
	2.4	Complex mechanical seals are inspected for abnormalities, in accordance with workplace procedures
3 Maintain complex mechanical seals	**3.1**	Maintenance is performed on complex seals, in accordance with workplace procedures and manufacturers' specifications
	3.2	Complex mechanical seal assemblies are dismantled, in accordance with workplace procedures, using approved engineering principles
	3.3	Components and/or parts are clearly marked and sketches produced, as required, in accordance with workplace procedures, for identification
	3.4	Component wear and clearances are determined using precise measuring techniques and approved testing equipment, in accordance with workplace procedures and manufacturers' specifications
	3.5	Components found to be faulty are repaired or replaced, in accordance with workplace procedures, to conform with manufacturers' specifications
	3.6	New components are inspected for compliance and are prepared for reassembly, in accordance with workplace procedures and manufacturers' specifications
	3.7	Component parts are refitted to complex mechanical seal assemblies, in accordance with workplace procedures and manufacturers' specifications
	3.8	Modifications or alterations to complex mechanical seals are undertaken, in accordance with workplace procedures
4 Replace or install complex mechanical seals	**4.1**	Equipment is prepared for complex mechanical seal replacement, in accordance with workplace procedures
	4.2	Complex mechanical seals are replaced, in accordance with workplace procedures and manufacturers'

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		specifications
	4.3	All fastenings are torqued, in accordance with workplace procedures and manufacturers' specifications
	4.4	Machinery and/or plant are test run, monitored and adjusted, as required, in accordance with workplace procedures and manufacturers' specifications
5 Complete work	**5.1**	Work is completed and appropriate personnel are notified, in accordance with workplace procedures
	5.2	Work area is cleared of waste, cleaned, restored and secured, in accordance with workplace procedures
	5.3	Tools and equipment are cleaned, maintained and stored, in accordance with workplace procedures
	5.4	Work completion details are finalised, in accordance with workplace procedures

Foundation Skills

Foundation skills essential to performance are explicit in the performance criteria of this unit of competency.

Range of Conditions

Range is restricted to essential operating conditions and any other variables essential to the work environment.

Non-essential conditions may be found in the Companion Volume Implementation Guide.

Unit Mapping Information

This unit replaces and is equivalent to UEPMNT401B Install and maintain complex mechanical seals.

Links

Companion Volume implementation guides are found in VETNet - https://vetnet.gov.au/Pages/TrainingDocs.aspx?q=1715b9fa-e7bd-441c-bb8d-cf22c9c825a8

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Assessment Requirements for UEPMNT401 Install and maintain complex mechanical seals

Modification History

Release 1. This is the first release of this unit of competency in the UEP Generation Training Package.

Performance Evidence

Evidence required to demonstrate competence in this unit must be relevant to and satisfy all the requirements of the elements, performance criteria and range of conditions on at least two separate occasions and includes:

- applying Work, Health and Safety (WHS)/Occupational Health and Safety (OHS) requirements including:
  - emergency procedures
  - hazard identification
  - risk control measures
  - safe working practices
- communicating with personnel
- completing work
- determining permit to work requirements
- interpreting manufacturers' specifications and manuals
- maintain complex mechanical seals
- manufacturing and installing seals and gaskets
- planning for installation and maintenance of complex mechanical seals work
- recognising worn or damaged components
- remove complex mechanical seals for maintenance
- replace or install complex mechanical seals
- selecting materials and components
- undertaking dismantling and reassembling techniques
- using measuring equipment
- using tools
- utilising removal, installation and maintenance techniques and procedures
- working with diagnostic and testing techniques

Knowledge Evidence

Evidence required to demonstrate competence in this unit must be relevant to and satisfy all the requirements of the elements, performance criteria and range of conditions and includes knowledge of:

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- diagnosis and repair of faults in complex mechanical seals
- generation plant and equipment, its location and operation
- isolations
- legislation, industry standards, codes of practice and regulations
- level and aligning techniques
- manufacturers' specifications and manuals
- materials and components
- permit to work system
- precision measuring equipment
- technical drawings
- test techniques
- tools
- types and materials of seals and gaskets
- typical arrangements of power production plant
- WHS/OHS legislated requirements including:
  - emergency procedures
  - hazard identification
  - risk control measures
  - safe working practices
- workplace documentation
- workplace policies and procedures

Assessment Conditions

As a minimum, assessors must satisfy applicable regulatory requirements, which include requirements in the Standards for Registered Training Organisations current at the time of assessment.

As a minimum, assessment must satisfy applicable regulatory requirements, which include requirements in the Standards for Registered Training Organisations current at the time of assessment.

Assessment processes and techniques must be appropriate to the language, literacy and numeracy requirements of the work being performed and the needs of the candidate.

Assessment must occur in workplace operational situations. Where this is not appropriate, assessment must occur in simulated workplace operational situations that reflect workplace conditions. Resources for assessment must include access to:

- a range of relevant exercises, case studies and/or other simulations
- relevant and appropriate materials, tools, equipment and personal protective equipment currently used in industry
- applicable documentation including workplace procedures, industry standards, equipment specifications, regulations, codes of practice and operation manuals.

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Links

Companion Volume implementation guides are found in VETNet - https://vetnet.gov.au/Pages/TrainingDocs.aspx?q=1715b9fa-e7bd-441c-bb8d-cf22c9c825a8

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UEPMNT402 Conduct complex levelling and alignment

Modification History

Release 1. This is the first release of this unit of competency in the UEP Generation Training Package.

Application

This unit involves the skills and knowledge required to conduct levelling and the advanced alignment of power generation plant and machinery, this may include high speed rotating plant.

Levelling is the process in which differences in height between two or more points are determined. Alignment is placing or arranging in a straight line, this can include adjusting parts of a mechanism to produce a required relationship or orientation.

Competency in this unit requires the ability to plan and prepare work, perform alignments and complete all work tasks. Individuals will, in general, work as a maintenance operative in a power generation facility.

Power generation maintenance personnel are typically trained and authorised to receive permits to work.

No licensing, legislative or certification requirements apply to this unit at the time of publication.

Note: Workplace practice

The application of the skills and knowledge described in this unit of competency may require a licence or training permit to practice in the workplace, where work is carried out on gas and electrical installations. Additional and/or other conditions may apply under state and territory legislative and regulatory licensing requirements.

Pre-requisite Unit

MEM18009B Perform levelling and alignment of machines and engineering components

MEM09002B Interpret technical drawing

MEM12023A Perform engineering measurements

MEM18001C Use hand tools

MEM18002B Use power tools/hand held operations

MEM18003C Use tools for precision work

MEM18055B Dismantle, replace and assemble engineering components

MEM18006C Repair and fit engineering components

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Competency Field

Maintenance

Unit Sector

Electricity generation

Elements and Performance Criteria

ELEMENTS	PERFORMANCE CRITERIA
Elements describe the essential outcomes.	Performance criteria describe the performance needed to demonstrate achievement of the element.
1 Plan and prepare for work	**1.1** Requirements including scope of work and assigned roles are identified and confirmed with appropriate personnel or by site inspection, in accordance with workplace procedures
	1.2 Work, Health and Safety (WHS)/Occupational Health and Safety (OHS) regulations, legislative requirements, industry standards, codes of practice, manufacturers' specifications, environmental obligations and workplace procedures are reviewed in preparation for work
	1.3 Resources are obtained and inspected, in accordance with workplace procedures for compliance with job specification
	1.4 Relevant plans, drawings and manual are selected and used, in accordance with workplace procedures
	1.5 Correct materials and components for work are obtained and inspected, in accordance with workplace procedures, for compliance with the job specification
	1.6 Work is planned, sequenced and prioritised, in accordance with workplace procedures
	1.7 Potential hazards are identified and risk control measures are selected and implemented, in accordance with workplace procedures
	1.8 Work area is prepared, in accordance with workplace procedures

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2 Perform alignment	**2.1** Isolations for work are confirmed, in accordance with workplace procedures
	2.2 Measurements are taken, and recorded, to facilitate compliance with manufacturers' specifications and job requirements
	2.3 Levelling and alignment calculations are performed, and sketches are made, in accordance with workplace procedures
	2.4 Power generation plant and machinery is levelled and aligned, and adjustments are made, in accordance with workplace procedures, to ensure compliance with manufacturers' specifications
	2.5 Final alignment inspections are undertaken, and fastenings are torqued, in accordance with workplace procedures and manufacturers' specifications
	2.6 Power generation plant and machinery is test run, monitored and adjusted, in accordance with workplace procedures and manufacturers' specifications
3 Complete work	**3.1** Work is completed and appropriate personnel are notified, in accordance with workplace procedures
	3.2 Work area is cleared of waste, cleaned, restored and secured in accordance with workplace procedures
	3.3 Tools and equipment are maintained and stored in accordance with workplace procedures
	3.4 Work completion details are finalised, in accordance with workplace procedures

Foundation Skills

Foundation skills essential to performance are explicit in the performance criteria of this unit of competency.

Range of Conditions

Range is restricted to essential operating conditions and any other variables essential to the work environment.

Non-essential conditions may be found in the Companion Volume Implementation Guide.

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Unit Mapping Information

This unit replaces and is equivalent to UEPMNT402B Conduct complex levelling and alignment

Links

Companion Volume implementation guides are found in VETNet - https://vetnet.gov.au/Pages/TrainingDocs.aspx?q=1715b9fa-e7bd-441c-bb8d-cf22c9c825a8

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Assessment Requirements for UEPMNT402 Conduct complex levelling and alignment

Modification History

Release 1. This is the first release of this unit of competency in the UEP Generation Training Package.

Performance Evidence

Evidence required to demonstrate competence in this unit must be relevant to and satisfy all the requirements of the elements, performance criteria and range of conditions on at least two separate occasions and includes:

- applying Work, Health and Safety (WHS)/Occupational Health and Safety (OHS) requirements including:
  - emergency procedures
  - identifying hazards
  - risk control measures
  - safe working practices
- calculating and applying adjustment techniques
- communicating with personnel
- completing work as per scheduled requirements
- determining permit to work requirements
- implementing legislation, industry standards, codes of practice and regulations
- operating precision measuring equipment
- performing alignment
- performing complex levelling and aligning principles whilst working to precise tolerances
- planning to conduct complex levelling and alignment work
- undertaking isolations
- using manufacturers' specifications and manuals
- utilising testing and inspection techniques
- working with technical drawings

Knowledge Evidence

Evidence required to demonstrate competence in this unit must be relevant to and satisfy all the requirements of the elements, performance criteria and range of conditions and includes knowledge of:

- calculations for alignment and levelling adjustments
- complex levelling and aligning practices

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- inspection and testing methods
- isolations
- legislation, industry standards, codes of practice and regulations
- manufacturers' specifications and manuals
- permit to work requirements
- power generation plant and equipment, its location and operation
- precision measuring equipment
- technical drawings
- tolerances
- typical arrangements of power production plant
- WHS/OHS legislated requirements including:
  - emergency procedures
  - identifying hazards
  - risk control measures
  - safe working practices
- workplace documentation
- workplace policies and procedures

Assessment Conditions

As a minimum, assessors must satisfy applicable regulatory requirements, which include requirements in the Standards for Registered Training Organisations current at the time of assessment.

As a minimum, assessment must satisfy applicable regulatory requirements, which include requirements in the Standards for Registered Training Organisations current at the time of assessment.

Assessment processes and techniques must be appropriate to the language, literacy and numeracy requirements of the work being performed and the needs of the candidate.

Assessment must occur in workplace operational situations. Where this is not appropriate, assessment must occur in simulated workplace operational situations that reflect workplace conditions.

Resources for assessment must include access to:

- a range of relevant exercises, case studies and/or other simulations
- relevant and appropriate materials, tools, equipment and personal protective equipment currently used in industry
- applicable documentation including workplace procedures, industry standards, equipment specifications, regulations, codes of practice and operation manuals.

Links

Companion Volume implementation guides are found in VETNet - https://vetnet.gov.au/Pages/TrainingDocs.aspx?q=1715b9fa-e7bd-441c-bb8d-cf22c9c825a8

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UEPMNT403 Maintain complex mechanical valves

Modification History

Release 1. This is the first release of this unit of competency in the UEP Generation Training Package.

Application

This unit involves the skills and knowledge required to undertake fault finding, diagnosis, repair or overhaul of complex mechanical valves, excluding associated servo or actuating units.

A fault is defined as an abnormal condition or defect of a mechanical valve which may lead to a failure in power generation facility equipment, systems and/or plant. Diagnosis and repair requires the identification of the type of fault, its cause and the determination of repair actions.

Competency in this unit requires the ability to plan work, remove mechanical valves for maintenance, perform mechanical valve maintenance, replace and/or install valves and to report on all completed work tasks. Individuals will, in general, work under supervision in an electrical, electronic and/or mechanical equipment repair workshop or on site.

Power generation maintenance personnel are typically trained and authorised to receive permits to work.

No licensing, legislative or certification requirements apply to this unit at the time of publication.

Note: Workplace practice

The application of the skills and knowledge described in this unit of competency may require a licence or training permit to practice in the workplace, where work is carried out on gas and electrical installations. Additional and/or other conditions may apply under state and territory legislative and regulatory licensing requirements.

Pre-requisite Unit

UEPMNT303 Maintain mechanical valves

MEM18006C Repair and fit engineering components

MEM09002B Interpret technical drawing

MEM12023A Perform engineering measurements

MEM18001C Use hand tools

MEM18002B Use power tools/hand held operations

MEM18003C Use tools for precision work

MEM18055B Dismantle, replace and assemble engineering components

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Competency Field

Maintenance

Unit Sector

Electricity generation

Elements and Performance Criteria

ELEMENTS	PERFORMANCE CRITERIA
Elements describe the essential outcomes.	Performance criteria describe the performance needed to demonstrate achievement of the element.
1 Plan and prepare for work	**1.1** Requirements including scope of work and assigned roles are identified and confirmed with appropriate personnel or by site inspection, in accordance with workplace procedures
	1.2 Work, Health and Safety (WHS)/Occupational Health and Safety (OHS) regulations, legislative requirements, industry standards, codes of practice, manufacturer specifications, environmental obligations and workplace procedures are reviewed in preparation for work
	1.3 Resources are obtained and inspected for compliance with job specification
	1.4 Relevant plans, drawings and manuals are selected and used, in accordance with workplace procedures
	1.5 Correct materials and components for work are obtained and inspected, in accordance with workplace procedures, for compliance with job specification
	1.6 Work is planned, sequenced and prioritised, in accordance with workplace procedures
	1.7 Potential hazards are identified and risk control measures are selected and implemented, in accordance with the workplace procedures
	1.8 Work area is prepared, in accordance with workplace procedures

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2	**Remove complex mechanical valves for maintenance**	**2.1** Isolations for work are confirmed, in accordance with workplace procedures
		2.2 Complex mechanical valve is disconnected, in accordance with workplace procedures
		2.3 Complex mechanical valve is removed, in accordance with workplace procedures
		2.4 Complex mechanical valve is inspected for abnormalities, in accordance with workplace procedures
3	**Perform complex mechanical valve maintenance**	**3.1** Maintenance is performed, in accordance with workplace procedures and manufacturers' specifications
		3.2 Complex mechanical valve is dismantled, clearly marked for identification and sketches are drawn, in accordance with workplace procedures
		3.3 Components are prepared for reassembly, in accordance with workplace procedures, manufacturers' drawings or manuals
		3.4 New components are inspected, in accordance with workplace procedures, to ensure compliance with manufacturers' specifications
		3.5 Dimensional inspection is performed, in accordance with workplace procedures, using precision measuring devices to ensure compliance with manufacturers' specifications
		3.6 Components are reassembled for testing, in accordance with workplace procedures and manufacturers' specifications
		3.7 Modifications or alterations are undertaken, in accordance with workplace procedures and manufacturers' specifications
		3.8 Components are levelled, aligned, coupled and connected, in accordance with workplace procedures and manufacturers' specifications
		3.9 Complex mechanical valves are pressure tested, monitored and adjusted, in accordance with workplace procedures and manufacturers' specifications

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4 Replace or install complex mechanical valves	**4.1**	Equipment is prepared for valve replacement, in accordance with workplace procedures
	4.2	Complex mechanical valve is replaced, in accordance with workplace procedures and manufacturers' specifications
	4.3	Complex mechanical valve is connected, in accordance with workplace procedures and manufacturers' specifications
	4.4	Final inspection is completed, in accordance with workplace procedures
5 Complete work	**5.1**	Work is completed and appropriate personnel are notified, in accordance with workplace procedures
	5.2	Work area is cleared of waste, cleaned, restored and secured, in accordance with workplace procedures
	5.3	Tools and equipment are cleaned, maintained and stored, in accordance with workplace procedures
	5.4	Work completion details are finalised, in accordance with workplace procedures

Foundation Skills

Foundation skills essential to performance are explicit in the performance criteria of this unit of competency.

Range of Conditions

Range is restricted to essential operating conditions and any other variables essential to the work environment.

Non-essential conditions may be found in the Companion Volume Implementation Guide.

Unit Mapping Information

This unit replaces and is equivalent to UEPMNT403B Maintain complex mechanical valves.

Links

Companion Volume implementation guides are found in VETNet - https://vetnet.gov.au/Pages/TrainingDocs.aspx?q=1715b9fa-e7bd-441c-bb8d-cf22c9c825a8

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Assessment Requirements for UEPMNT403 Maintain complex mechanical valves

Modification History

Release 1. This is the first release of this unit of competency in the UEP Generation Training Package.

Performance Evidence

Evidence required to demonstrate competence in this unit must be relevant to and satisfy all the requirements of the elements, performance criteria and range of conditions on at least two separate occasions and includes:

- analysing data using analysis techniques and tools
- applying Work, Health and Safety (WHS)/Occupational Health and Safety (OHS) requirements including:
  - emergency procedures
  - hazard identification
  - risk control measures
  - safe working practices
- communicating with personnel
- completing work as per scheduled requirements
- determining permit to work requirements
- implementing legislation, industry standards, codes of practice and regulations
- interpreting manufacturers' specifications and manuals
- levelling and aligning using approved techniques
- performing complex mechanical valve maintenance using maintenance techniques and procedures
- performing dismantling and assembling techniques
- planning for maintenance of complex mechanical valve work
- reading technical drawings and data
- recognising worn or damaged components
- rectifying faults
- removing valves for complex mechanical valve maintenance using removal techniques
- replacing or installing complex mechanical valves using installation techniques and procedures
- selecting materials and components
- undertaking valve operational techniques
- utilising diagnostic and testing techniques
- working with precision measuring equipment and tools

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Knowledge Evidence

Evidence required to demonstrate competence in this unit must be relevant to and satisfy all the requirements of the elements, performance criteria and range of conditions and includes knowledge of:

- diagnostic and testing techniques
- legislation, industry standards, codes of practice and regulations
- level and aligning techniques
- maintain complex mechanical valves plant and equipment, its location and operation
- manufacturers' specifications and manuals
- measuring equipment
- permit to work system
- technical drawings and data
- tools
- typical arrangements of power production plant
- valve materials, components and operations of
- valve operating arrangements
- WHS/OHS legislated requirements including:
  - emergency procedures
  - hazard identification
  - risk control measures
  - safe working practices
- workplace documentation
- workplace policies and procedures

Assessment Conditions

As a minimum, assessors must satisfy applicable regulatory requirements, which include requirements in the Standards for Registered Training Organisations current at the time of assessment.

As a minimum, assessment must satisfy applicable regulatory requirements, which include requirements in the Standards for Registered Training Organisations current at the time of assessment.

Assessment processes and techniques must be appropriate to the language, literacy and numeracy requirements of the work being performed and the needs of the candidate.

Assessment must occur in workplace operational situations. Where this is not appropriate, assessment must occur in simulated workplace operational situations that reflect workplace conditions. Resources for assessment must include access to:

- a range of relevant exercises, case studies and/or other simulations
- relevant and appropriate materials, tools, equipment and personal protective equipment currently used in industry
- applicable documentation including workplace procedures, industry standards, equipment

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specifications, regulations, codes of practice and operation manuals.

Links

Companion Volume implementation guides are found in VETNet - https://vetnet.gov.au/Pages/TrainingDocs.aspx?q=1715b9fa-e7bd-441c-bb8d-cf22c9c825a8

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UEPMNT404 Maintain complex mechanical pumps

Modification History

Release 1. This is the first release of this unit of competency in the UEP Generation Training Package.

Application

This unit involves the skills and knowledge required to undertake the maintenance of complex mechanical pumps which may include multi-stage centrifugal pumps, axial flow compressors, fans and blowers.

Maintenance is the process of regularly monitoring, inspecting and maintaining complex mechanical pumps in a power generation facility to ensure optimal performance.

Competency in this unit requires the ability to plan work, remove complex mechanical pumps for maintenance, maintain complex mechanical pumps, replace or install complex mechanical pumps and to report on all completed work tasks. Individuals will, in general, work under supervision in an electrical, electronic and/or mechanical equipment repair workshop or on site.

Power generation maintenance personnel are typically trained and authorised to receive permits to work.

No licensing, legislative or certification requirements apply to this unit at the time of publication.

Note: Workplace practice

The application of the skills and knowledge described in this unit of competency may require a licence or training permit to practice in the workplace, where work is carried out on gas and electrical installations. Additional and/or other conditions may apply under state and territory legislative and regulatory licensing requirements.

Pre-requisite Unit

UEPMNT304 Maintain mechanical pumps

MEM18006C Repair and fit engineering components

MEM09002B Interpret technical drawing

MEM12023A Perform engineering measurements

MEM18001C Use hand tools

MEM18002B Use power tools/hand held operations

MEM18003C Use tools for precision work

MEM18055B Dismantle, replace and assemble engineering components

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Competency Field

Maintenance

Unit Sector

Electricity generation

Elements and Performance Criteria

ELEMENTS	PERFORMANCE CRITERIA
Elements describe the essential outcomes.	Performance criteria describe the performance needed to demonstrate achievement of the element.
1 Plan and prepare for work	**1.1** Requirements including scope of work and assigning roles are identified and confirmed with appropriate personnel or by site inspection, in accordance with workplace procedures
	1.2 Work, Health and Safety (WHS)/Occupational Health and Safety (OHS) regulations, legislative requirements, industry standards, codes of practice, manufacturer specifications, environmental obligations and workplace procedures are reviewed in preparation for work
	1.3 Resources are obtained and inspected for compliance with job specification
	1.4 Relevant plans, drawings and manuals are selected and used, in accordance with workplace procedures
	1.5 Correct materials and components for work are obtained and inspected, in accordance with workplace procedures, for compliance with job specification
	1.6 Work is planned, sequenced and prioritised, in accordance with workplace procedures
	1.7 Potential hazards are identified and risk control measures are selected and implemented, in accordance with workplace procedures
	1.8 Work area is prepared, in accordance with workplace procedures
2 Remove complex mechanical pumps for	**2.1** Isolations for work are confirmed, in accordance with

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maintenance		workplace procedures
	2.2	Complex mechanical pump is disconnected, in accordance with workplace procedures
	2.3	Complex mechanical pump is removed, in accordance with workplace procedures
	2.4	Complex mechanical pump is inspected for abnormalities, in accordance with workplace procedures
3 Maintain complex mechanical pumps	**3.1**	Maintenance is performed on complex mechanical pump, in accordance with workplace procedures and manufacturers' specifications
	3.2	Complex mechanical pump is dismantled for maintenance, in accordance with workplace procedures and manufacturers' specifications
	3.3	Sketches are made, data noted and components marked for identification or reassembly, in accordance with workplace procedures
	3.4	New components are inspected, in accordance with workplace procedures, for compliance with manufacturers' specifications
	3.5	Dimensional inspection is performed with precision measuring devices, in accordance with workplace procedures, to ensure compliance with manufactures' specifications and results are recorded
	3.6	Complex mechanical pump is reassembled, using industry principles and approved techniques, in accordance with workplace procedures and manufacturers' specifications
	3.7	Modifications or alterations are undertaken, in accordance with workplace procedures
4 Replace or install complex mechanical pumps	**4.1**	Equipment and plant is prepared for complex mechanical pump replacement, in accordance with workplace procedures
	4.2	Complex mechanical pump is replaced, in accordance with workplace procedures and manufacturers' specifications
	4.3	Complex mechanical pump is levelled, aligned, coupled and connected, in accordance with workplace

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		procedures
	4.4	All fastenings are torqued, in accordance with workplace procedures and manufacturers' specifications
	4.5	Machinery, plant and pump are given a test run, then monitored and adjusted, as required, in accordance with workplace procedures and manufacturers' specifications
5 Complete work	**5.1**	Work is completed and appropriate personnel are notified, in accordance with workplace procedures
	5.2	Work area is cleared of waste, cleaned, restored and secured, in accordance with workplace procedures
	5.3	Tools and equipment are cleaned, maintained and stored, in accordance with workplace procedures
	5.4	Work completion details are finalised, in accordance with workplace procedures

Foundation Skills

Foundation skills essential to performance are explicit in the performance criteria of this unit of competency.

Range of Conditions

Range is restricted to essential operating conditions and any other variables essential to the work environment.

Non-essential conditions may be found in the Companion Volume Implementation Guide.

Unit Mapping Information

This unit replaces and is equivalent to UEPMNT404B Maintain complex mechanical pumps.

Links

Companion Volume implementation guides are found in VETNet - https://vetnet.gov.au/Pages/TrainingDocs.aspx?q=1715b9fa-e7bd-441c-bb8d-cf22c9c825a8

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Assessment Requirements for UEPMNT404 Maintain complex mechanical pumps

Modification History

Release 1. This is the first release of this unit of competency in the UEP Generation Training Package.

Performance Evidence

Evidence required to demonstrate competence in this unit must be relevant to and satisfy all the requirements of the elements, performance criteria and range of conditions on at least two separate occasions and includes:

- analysing using data analysis techniques
- applying Work, Health and Safety(WHS)/Occupational Health and Safety (OHS) requirements including:
  - emergency procedures
  - hazard identification
  - risk control measures
  - safe working practices
- communicating with personnel
- completing work as per scheduled requirements
- determining permit to work requirements
- dismantling and reassembling techniques for maintaining complex mechanical valves
- implementing legislation, industry standards, codes of practice and regulations
- interpreting manufacturers' specifications and manuals
- levelling and aligning with approved techniques
- maintaining complex mechanical pumps using maintenance techniques and procedures
- operating with torque techniques
- planning for maintenance of complex mechanical pump work
- reading technical drawings and data
- recognising worn or damaged components
- removing complex mechanical pumps for maintenance using removal techniques
- replacing or installing complex mechanical pumps using installation techniques and procedures
- selecting materials and components
- testing using diagnostic and testing techniques
- undertaking isolations and torqueing
- using tools
- utilising precision measuring equipment
- working with and applying fluid dynamics principles

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Knowledge Evidence

Evidence required to demonstrate competence in this unit must be relevant to and satisfy all the requirements of the elements, performance criteria and range of conditions and includes knowledge of:

- analysis and data recording techniques
- diagnostic and testing techniques
- fluid dynamics
- isolations
- legislation, industry standards, codes of practice and regulations
- level and alignment techniques
- maintenance of complex mechanical pumps generation plant and equipment, its location and operation
- manufacturers' specifications and manuals
- materials and components of pumps
- permit to work system
- precision measuring equipment
- technical drawings and data
- tools
- torque techniques
- typical arrangements of power production plant
- WHS/OHS legislated requirements including:
  - emergency procedures
  - risk control measures
  - hazard identification
  - safe working practices
- workplace documentation
- workplace policies and procedures

Assessment Conditions

As a minimum, assessors must satisfy applicable regulatory requirements, which include requirements in the Standards for Registered Training Organisations current at the time of assessment.

As a minimum, assessment must satisfy applicable regulatory requirements, which include requirements in the Standards for Registered Training Organisations current at the time of assessment.

Assessment processes and techniques must be appropriate to the language, literacy and numeracy requirements of the work being performed and the needs of the candidate.

Assessment must occur in workplace operational situations. Where this is not appropriate, assessment must occur in simulated workplace operational situations that reflect workplace conditions. Resources for assessment must include access to:

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- a range of relevant exercises, case studies and/or other simulations
- relevant and appropriate materials, tools, equipment and personal protective equipment currently used in industry applicable documentation including workplace procedures, industry standards, equipment specifications, regulations, codes of practice and operation manuals.

Links

Companion Volume implementation guides are found in VETNet - https://vetnet.gov.au/Pages/TrainingDocs.aspx?q=1715b9fa-e7bd-441c-bb8d-cf22c9c825a8

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UEPMNT408 Install hydro turbines

Modification History

Release 1. This is the first release of this unit of competency in the UEP Generation Training Package.

Application

This unit involves the skills and knowledge required to install hydro turbines. The installation of a hydro turbine refers to a hydro turbine being removed from service, for repair and overhaul.

Installation is a key feature of placing hydro turbines into service, it can include conducting repairs and/or the overhaul of a hydro turbine to ensure reliability of operation during its service life.

Competency in this unit requires the ability to plan work, disassemble a hydro turbine, inspect hydro turbine's components, repair a hydro turbine and/or its' components and to report on all completed work tasks. Individuals will, in general, work under supervision as a maintenance operative in a power generation facility.

Power generation maintenance personnel are typically trained and authorised to receive permits to work.

No licensing, legislative or certification requirements apply to this unit at the time of publication.

Note: Workplace practice

The application of the skills and knowledge described in this unit of competency may require a licence or training permit to practice in the workplace, where work is carried out on gas and electrical installations. Additional and/or other conditions may apply under state and territory legislative and regulatory licensing requirements.

Pre-requisite Unit

UEPMNT402 Conduct complex levelling and alignment

MEM18009B Perform levelling and alignment of machines and engineering components

MEM09002B Interpret technical drawing

MEM12023A Perform engineering measurements

MEM18001C Use hand tools

MEM18002B Use power tools/hand held operations

MEM18003C Use tools for precision work

MEM18055B Dismantle, replace and assemble engineering components

MEM18006C Repair and fit engineering components

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Competency Field

Maintenance

Unit Sector

Electricity generation

Elements and Performance Criteria

ELEMENTS	PERFORMANCE CRITERIA
Elements describe the essential outcomes.	Performance criteria describe the performance needed to demonstrate achievement of the element.
1 Plan and prepare for work	**1.1** Requirements including scope of work and assigned roles are identified and confirmed with appropriate personnel or by site inspection, in accordance with workplace procedures
	1.2 Work, Health and Safety (WHS)/Occupational Health and Safety (OHS) regulations, legislative requirements, industry standards, codes of practice, manufacturers' specifications, environmental obligations and workplace procedures are reviewed in preparation for work
	1.3 Resources are obtained and inspected for compliance with job specification
	1.4 Relevant plans, drawings and manuals are selected and used, in accordance with workplace procedures
	1.5 Correct materials and components for work are obtained and inspected for compliance with job specification
	1.6 Work is planned, sequenced and prioritised, in accordance with workplace procedures
	1.7 Potential hazards are identified and risk control measures are selected and implemented, in accordance with workplace procedures
	1.8 Work area is prepared, in accordance with workplace procedures
2 Disassemble hydro turbine	**2.1** Isolations for work are confirmed, in accordance with workplace procedures

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	2.2	Hydro turbine is disassembled, in accordance with manufacturers' specifications and workplace procedures
	2.3	Hydro turbine components are removed in priority order, in accordance with manufacturers' specification and workplace procedures
	2.4	Disassembly is carried out to facilitate reassembly, in accordance with workplace procedures
	2.5	Components are measured and clearances are taken, in accordance with workplace procedures, to determine conformity to manufacturer’s limits and to ensure assembly meets manufacturers' specifications
	2.6	Measurements and clearances are recorded, in accordance with manufacturer' specifications and workplace procedures
3 Inspect hydro turbine components	**3.1**	Components are cleaned and inspected, in accordance with workplace procedures
	3.2	Faults are identified and recorded, in accordance with workplace procedures
	3.3	New components are inspected for compliance to manufacturers' specifications, in accordance with workplace procedures
	3.4	Components are prepared for assembly, in accordance with workplace procedures
4 Repair hydro turbine or components	**4.1**	Repairs are carried out, in accordance with workplace procedures
	4.2	Repairs are tested and results are analysed to ensure conformance to manufactures' specifications, in accordance with workplace procedures
	4.3	Data from testing is recorded, in accordance with workplace procedures
5 Reassemble hydro turbine	**5.1**	Equipment and plant is prepared for reassembly of hydro turbine, in accordance with workplace procedures.
	5.2	Isolations are confirmed, in accordance with workplace procedures
	5.3	Components are refitted, in accordance with workplace

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		procedures and manufacturers' specifications.
	5.4	Hydro turbine is assembled, in accordance with workplace procedures and manufacturers' specifications.
	5.5	Hydro turbine is test run, and operating characteristics are monitored, to ensure compliance with manufacturers' specifications, in accordance with workplace procedures
6 Complete work	**6.1**	Work is completed and appropriate personnel are notified in accordance with workplace procedures
	6.2	Work area is cleared of waste, cleaned, restored and secured, in accordance with workplace procedures
	6.3	Tools and equipment are maintained and stored, in accordance with workplace procedures
	6.4	Work completion details are finalised, in accordance with workplace procedures

Foundation Skills

Foundation skills essential to performance are explicit in the performance criteria of this unit of competency.

Range of Conditions

Range is restricted to essential operating conditions and any other variables essential to the work environment.

Non-essential conditions may be found in the Companion Volume Implementation Guide.

Unit Mapping Information

This unit replaces and is equivalent to UEPMNT408B Install hydro turbines.

Links

Companion Volume implementation guides are found in VETNet - https://vetnet.gov.au/Pages/TrainingDocs.aspx?q=1715b9fa-e7bd-441c-bb8d-cf22c9c825a8

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Assessment Requirements for UEPMNT408 Install hydro turbines

Modification History

Release 1. This is the first release of this unit of competency in the UEP Generation Training Package.

Performance Evidence

Evidence required to demonstrate competence in this unit must be relevant to and satisfy all the requirements of the elements, performance criteria and range of conditions on at least two separate occasions and includes:

- applying maintenance and installation techniques
- applying Work, Health and Safety (WHS)/Occupational Health and Safety (OHS) requirements including:
  - emergency procedures
  - identifying hazardous materials
  - risk control measures
  - safe working practices
- communicating with personnel
- completing work as per scheduled requirements
- determining permit to work requirements
- diagnosing and testing using precision measuring equipment
- disassembling hydro turbine
- identifying components
- implementing legislation, industry standards, codes of practices and regulations
- inspecting hydro turbine components
- interpreting manufacturers' specifications and manuals
- performing isolations
- planning for installation of hydro turbine work
- reassembling hydro turbine
- recognising worn, damaged or faulty components
- repairing hydro turbine or components using replacement techniques
- using drawings and data

Knowledge Evidence

Evidence required to demonstrate competence in this unit must be relevant to and satisfy all the requirements of the elements, performance criteria and range of conditions and includes knowledge of:

- data recording techniques

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- diagnostic and test techniques
- hydro turbine types and characteristics
- installation and maintenance techniques
- isolations
- legislation, industry standards, codes of practices and regulations
- manufacturers' specifications and manuals
- permit to work system
- power generation plant and equipment, its location and operation
- technical drawings
- typical arrangements of power production plant
- WHS/OHS legislated requirements including:
  - emergency procedures
  - identifying hazardous materials
  - risk control measures
  - safe working practices
- workplace documentation
- workplace policies and procedures

Assessment Conditions

As a minimum, assessors must satisfy applicable regulatory requirements, which include requirements in the Standards for Registered Training Organisations current at the time of assessment.

As a minimum, assessment must satisfy applicable regulatory requirements, which include requirements in the Standards for Registered Training Organisations current at the time of assessment.

Assessment processes and techniques must be appropriate to the language, literacy and numeracy requirements of the work being performed and the needs of the candidate.

Assessment must occur in workplace operational situations. Where this is not appropriate, assessment must occur in simulated workplace operational situations that reflect workplace conditions.

Resources for assessment must include access to:

- a range of relevant exercises, case studies and/or other simulations
- relevant and appropriate materials, tools, equipment and personal protective equipment currently used in industry
- applicable documentation including workplace procedures, industry standards, equipment specifications, regulations, codes of practice and operation manuals.

Links

Companion Volume implementation guides are found in VETNet - https://vetnet.gov.au/Pages/TrainingDocs.aspx?q=1715b9fa-e7bd-441c-bb8d-cf22c9c825a8

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UEPMNT410 Diagnose and repair faults in electronic equipment

Modification History

Release 1. This is the first release of this unit of competency in the UEP Generation Training Package.

Application

This unit involves the skills and knowledge required to diagnose and repair faults in electronic equipment at board and component level; this may involve work to be carried out with equipment on line.

Diagnosing and repairing includes the inspection, testing and verification of the operation and reliability of electronic equipment including components, wires, cables, boards, terminations and support fixings used in a power generation facility.

Competency in this unit requires the ability to plan work, diagnose electronic equipment faults, find electronic equipment faults, determine cause of electronic equipment faults, repair electronic equipment faults and to report on all completed work tasks. Individuals will, in general, work under supervision in an electrical, electronic and/or mechanical equipment repair workshop or on site.

Power generation maintenance personnel are typically trained and authorised to receive permits to work.

No licensing, legislative or certification requirements apply to this unit at the time of publication.

Note: Workplace practice

The application of the skills and knowledge described in this unit of competency may require a licence or training permit to practice in the workplace, where work is carried out on gas and electrical installations. Additional and/or other conditions may apply under state and territory legislative and regulatory licensing requirements.

Pre-requisite Unit

UEENEEG108A Troubleshoot and repair faults in low voltage electrical apparatus and circuits

UEENEEE102A Fabricate, assemble and dismantle utilities industry components

UEENEEE104A Solve problems in D.C. circuits

UEENEEE105A Fix and secure electrotechnology equipment

UEENEEE107A Use drawings, diagrams, schedules, standards, codes and specifications

UEENEEG006A Solve problems in single and three phase low voltage machines

UEENEEG033A Solve problems in single and three phase low voltage electrical apparatus and circuits

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UEENEEG063A Arrange circuits, control and protection for general electrical installations

UEENEEG101A Solve problems in electromagnetic devices and related circuits

UEENEEG102A Solve problems in low voltage A.C. circuits

UEENEEG106A Terminate cables, cords and accessories for low voltage circuits

Competency Field

Maintenance

Unit Sector

Electricity generation

Elements and Performance Criteria

ELEMENTS	PERFORMANCE CRITERIA
Elements describe the essential outcomes.	Performance criteria describe the performance needed to demonstrate achievement of the element.
1 Plan and prepare for work	**1.1** Requirements including scope of work and assigned roles are identified and confirmed with appropriate personnel or by site inspection, in accordance with workplace procedures
	1.2 Work, Health and Safety (WHS)/Occupational Health and Safety (OHS) regulations, legislative requirements, industry standards, codes of practice, manufacturers' specifications, environmental obligations and workplace procedures are reviewed in preparation for work
	1.3 Resources are obtained and inspected for compliance with job specification
	1.4 Relevant plans, drawings and manuals are selected and used, in accordance with workplace procedures
	1.5 Correct materials and components for work are obtained and inspected, in accordance with workplace procedures, for compliance with job specification
	1.6 Work is planned, sequenced and prioritised, in accordance with workplace procedures
	1.7 Potential hazards are identified and risk control

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		measures are selected and implemented, in accordance with workplace procedures
	1.8	Work area is prepared, in accordance with workplace and site procedures
2 Verify electronic equipment fault	**2.1**	Normal performance and function of equipment is ascertained using manufacturers' manuals, in accordance with workplace procedures
	2.2	Fault indicators, technical information and diagnostic techniques are used to verify reported faults, in accordance with workplace procedures
	2.3	Electronic equipment faults are reproduced and are monitored, in accordance with workplace procedures
3 Find electronic equipment fault	**3.1**	Isolations for work are confirmed, in accordance with workplace procedures
	3.2	Electronic equipment components, wires, cables, terminations and support fixings are inspected for faults, in accordance with workplace procedures
	3.3	Diagnostic techniques are selected and used to determine faults, in accordance with workplace procedures
	3.4	Components are disconnected, in accordance with workplace procedures, to enable accurate test measurements of suspected faulty components ensuring back feed readings do not occur
	3.5	Test and measurement instruments are used, in accordance with workplace procedures, manufacturers' specifications and job requirements
4 Determine cause of electronic equipment fault	**4.1**	Appropriate personnel are consulted, in accordance with workplace procedures
	4.2	Information from fault indicators and maintenance records are used, in accordance with workplace procedures
5 Repair electronic equipment fault	**5.1**	Isolations are confirmed, in accordance with workplace procedures site requirements
	5.2	Faulty, worn, damaged or unsecured components are replaced or repaired, in accordance with workplace

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		procedures
	5.3	Electronic equipment parts and components are selected and replaced, as required, in accordance with workplace procedures and manufacturers' specifications
	5.4	Components disconnected for testing are reconnected, and all terminations are checked to ensure they are electrically and mechanically sound, in accordance with workplace procedures
	5.5	Faults are repaired, in accordance with workplace procedures
	5.6	Final inspection is performed, in accordance with workplace procedures
6 Complete work	**6.1**	Work is completed and appropriate personnel are notified, in accordance with workplace procedures
	6.2	Work area is cleared of waste, cleaned, restored and secured in accordance with workplace procedures
	6.3	Tools and equipment are cleaned, maintained and stored, in accordance with workplace procedures
	6.4	Work completion details are finalised, in accordance with workplace procedures

Foundation Skills

Foundation skills essential to performance are explicit in the performance criteria of this unit of competency.

Range of Conditions

Range is restricted to essential operating conditions and any other variables essential to the work environment.

Non-essential conditions may be found in the Companion Volume Implementation Guide.

Unit Mapping Information

This unit replaces and is equivalent to UEPMNT410B Diagnose and repair faults in electronic equipment.

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Links

Companion Volume implementation guides are found in VETNet - https://vetnet.gov.au/Pages/TrainingDocs.aspx?q=1715b9fa-e7bd-441c-bb8d-cf22c9c825a8

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Assessment Requirements for UEPMNT410 Diagnose and repair faults in electronic equipment

Modification History

Release 1. This is the first release of this unit of competency in the UEP Generation Training Package.

Performance Evidence

Evidence required to demonstrate competence in this unit must be relevant to and satisfy all the requirements of the elements, performance criteria and range of conditions on at least two separate occasions and includes:

- applying Work, Health and Safety (WHS)/Occupational Health and Safety (OHS) requirements including:
  - hazard identification
  - risk control measures
  - safe working practices
  - using emergency procedures
- completing work as per scheduled requirements
- determining cause of electronic equipment faults
- determining permit to work requirements
- diagnosing and repairing faults in electronic equipment using diagnostic and fault finding techniques and procedures
- finding electronic equipment faults
- implementing legislation, industry standards, codes of practice and regulations
- interpreting manufacturers' specifications and manuals
- planning for diagnosis and repair of faults in electronic equipment
- repairing electronic equipment faults using repair techniques and procedures
- selecting materials
- using tools and equipment
- utilising data analysis techniques and tools
- verifying electronic equipment faults using verification techniques
- working with test and measurement instruments

Knowledge Evidence

Evidence required to demonstrate competence in this unit must be relevant to and satisfy all the requirements of the elements, performance criteria and range of conditions and includes knowledge of:

- electronic equipment

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- equipment and materials
- fault finding, testing, verification and diagnostic techniques
- isolations
- legislation, industry standards, codes of practice and regulations
- manufacturers' specifications and manuals
- permit to work system
- plant and equipment, its location and operation
- repair techniques
- test and measurement instruments
- typical arrangements of power production plant
- WHS/OHS legislated requirements including:
  - hazard identification
  - risk control measures
  - safe working practices
  - using emergency procedures
- workplace documentation
- workplace policies and procedures

Assessment Conditions

As a minimum, assessors must satisfy applicable regulatory requirements, which include requirements in the Standards for Registered Training Organisations current at the time of assessment.

As a minimum, assessment must satisfy applicable regulatory requirements, which include requirements in the Standards for Registered Training Organisations current at the time of assessment.

Assessment processes and techniques must be appropriate to the language, literacy and numeracy requirements of the work being performed and the needs of the candidate.

Assessment must occur in workplace operational situations. Where this is not appropriate, assessment must occur in simulated workplace operational situations that reflect workplace conditions.

Resources for assessment must include access to

- a range of relevant exercises, case studies and/or other simulations
- relevant and appropriate materials, tools, equipment and personal protective equipment currently used in industry
- applicable documentation including workplace procedures, industry standards, equipment specifications, regulations, codes of practice and operation manuals.

Links

Companion Volume implementation guides are found in VETNet - https://vetnet.gov.au/Pages/TrainingDocs.aspx?q=1715b9fa-e7bd-441c-bb8d-cf22c9c825a8

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UEPMNT411 Diagnose and repair faults in complex electrical equipment

Modification History

Release 1. This is the first release of this unit of competency in the UEP Generation Training Package.

Application

This unit involves the skills and knowledge required to diagnose and repair faults in complex and High Voltage (H.V.) electrical equipment, this may involve work being carried out with equipment online.

Diagnosing and repairing faults includes the inspection, testing and verification of the operation and reliability of complex and H.V. electrical equipment used in a power generation facility.

Competency in this unit requires the ability to plan work, verify complex electrical equipment faults, find complex electrical equipment faults, determine cause of complex electrical equipment fault, repair complex electrical equipment fault and to report on all completed work tasks. Individuals will, in general, work under supervision in an electrical, electronic and/or mechanical equipment repair workshop or on site.

Power generation maintenance personnel are typically trained and authorised to receive permits to work.

No licensing, legislative or certification requirements apply to this unit at the time of publication.

Note: Workplace practice

The application of the skills and knowledge described in this unit of competency may require a licence or training permit to practice in the workplace, where work is carried out on gas and electrical installations. Additional and/or other conditions may apply under state and territory legislative and regulatory licensing requirements.

Pre-requisite Unit

UEENEEG108A Troubleshoot and repair faults in low voltage electrical apparatus and circuits

UEENEEE102A Fabricate, assemble and dismantle utilities industry components

UEENEEE104A Solve problems in D.C. circuits

UEENEEE105A Fix and secure electrotechnology equipment

UEENEEE107A Use drawings, diagrams, schedules, standards, codes and specifications

UEENEEG006A Solve problems in single and three phase low voltage machines

UEENEEG033A Solve problems in single and three phase low voltage electrical apparatus and circuits

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UEENEEG063A Arrange circuits, control and protection for general electrical installations

UEENEEG101A Solve problems in electromagnetic devices and related circuits

UEENEEG102A Solve problems in low voltage A.C. circuits

UEENEEG106A Terminate cables, cords and accessories for low voltage circuits

Competency Field

Maintenance

Unit Sector

Electricity generation

Elements and Performance Criteria

ELEMENTS	PERFORMANCE CRITERIA
Elements describe the essential outcomes.	Performance criteria describe the performance needed to demonstrate achievement of the element.
1 Plan and prepare for work	**1.1** Requirements including scope of work and assigned roles are identified and confirmed with appropriate personnel or by site inspection, in accordance with workplace procedures
	1.2 Work, Health and Safety (WHS)/Occupational Health and Safety (OHS) regulations, legislative requirements, industry standards, codes of practice, manufacturers' specifications, environmental obligations and workplace procedures are reviewed in preparation for work
	1.3 Resources are obtained and inspected for compliance with job specification
	1.4 Relevant plans, drawings and manuals are selected and used, in accordance with workplace procedures
	1.5 Correct materials and components for work are obtained and inspected, in accordance with workplace procedures, for compliance with job specification
	1.6 Work is planned, sequenced and prioritised, in accordance with workplace procedures
	1.7 Potential hazards are identified and risk control

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		measures are selected and implemented, in accordance with workplace procedures
	1.8	Work area is prepared, in accordance with workplace procedures
2 Diagnose complex electrical fault	**2.1**	Normal performance and function of complex and High Voltage electrical equipment is reviewed, in accordance with workplace procedures
	2.2	Complex and High Voltage electrical equipment fault indicators and technical information are used, in accordance with workplace procedures, to diagnose and verify reported faults
	2.3	Complex and High Voltage electrical equipment symptoms are reproduced and monitored, if possible, in accordance with workplace procedures
3 Find complex electrical equipment fault	**3.1**	Isolations for work are confirmed, where appropriate, in accordance with workplace procedures
	3.2	Complex electrical equipment components, wires, cables, terminations and support fixings are inspected, in accordance with workplace procedures, for faults
	3.3	Diagnostic techniques are selected and used to determine complex electrical equipment faults, in accordance with workplace procedures
	3.4	Components are disconnected, in accordance with workplace procedures, to enable test measurements of suspected faulty components whilst ensuring no back feed readings occur
	3.5	Test and measurement instruments are used, in accordance with workplace procedures and manufacturers' specifications
4 Determine cause of complex electrical equipment fault	**4.1**	Appropriate personnel are consulted, if required, in accordance with workplace procedures
	4.2	Information from fault indicators and maintenance records are used, in accordance with workplace procedures
	4.3	Conclusions about the nature and cause of the fault from analysis of evidence is undertaken, in accordance with

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		workplace procedures
5 Repair complex electrical equipment fault	**5.1**	Faulty, worn or damaged complex electrical equipment components are repaired, in accordance with workplace procedures
	5.2	Complex electrical equipment components disconnected for testing are reconnected, in accordance with workplace procedures, with terminations checked to ensure they are electrically and mechanically sound
	5.3	All faults are repaired, in accordance with workplace procedures
	5.4	Final inspection of complex electrical equipment is performed, in accordance with workplace procedures
6 Complete work	**6.1**	Work is completed and appropriate personnel are notified, in accordance with workplace procedures
	6.2	Work area is cleared of waste, cleaned, restored and secured, in accordance with workplace procedures
	6.3	Tools and equipment are cleaned, maintained and stored, in accordance with workplace procedures
	6.4	Work completion details are finalised, in accordance with workplace procedures

Foundation Skills

Foundation skills essential to performance are explicit in the performance criteria of this unit of competency.

Range of Conditions

Range is restricted to essential operating conditions and any other variables essential to the work environment.

Non-essential conditions may be found in the Companion Volume Implementation Guide.

Unit Mapping Information

This unit replaces and is equivalent to UEPMNT411B Diagnose and repair faults in complex electrical equipment.

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Links

Companion Volume implementation guides are found in VETNet - https://vetnet.gov.au/Pages/TrainingDocs.aspx?q=1715b9fa-e7bd-441c-bb8d-cf22c9c825a8

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Assessment Requirements for UEPMNT411 Diagnose and repair faults in complex electrical equipment

Modification History

Release 1. This is the first release of this unit of competency in the UEP Generation Training Package.

Performance Evidence

Evidence required to demonstrate competence in this unit must be relevant to and satisfy all the requirements of the elements, performance criteria and range of conditions on at least two separate occasions and includes:

- applying Work, Health and Safety (WHS)/Occupational Health and Safety (OHS) requirements including:
  - emergency procedures
  - hazard identification
  - risk control measures
- communicating with personnel
- completing work as per scheduled requirements
- determining permit to work requirements
- implementing regulations, industry standards, codes of practice and legislation
- planning diagnosis and repair of faults in complex electrical equipment work
- repairing faults using repair techniques
- safe working practices using diagnostic and fault finding techniques and procedures
- selecting materials and resources
- using manufacturers' specifications and manuals
- utilising testing and measurement instruments
- verifying and identifying faults
- working with tools and equipment

Knowledge Evidence

Evidence required to demonstrate competence in this unit must be relevant to and satisfy all the requirements of the elements, performance criteria and range of conditions and includes knowledge of:

- diagnosis and repair of faults in complex electrical equipment
- fault finding and diagnostic methods and techniques
- isolations
- legislation, industry standards, codes of practice and regulations

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- manufacturers' specifications and manuals
- materials to use in diagnosing and repairing complex electrical equipment
- permit to work system
- power generation plant and equipment, its location and operation
- repair methods and techniques
- test and measurement instruments
- typical arrangements of power production plant
- WHS/OHS legislated requirements including:
  - emergency procedures
  - hazard identification
  - risk control measures
  - safe working practices
- workplace documentation
- workplace policies and procedures

Assessment Conditions

As a minimum, assessors must satisfy applicable regulatory requirements, which include requirements in the Standards for Registered Training Organisations current at the time of assessment.

As a minimum, assessment must satisfy applicable regulatory requirements, which include requirements in the Standards for Registered Training Organisations current at the time of assessment.

Assessment processes and techniques must be appropriate to the language, literacy and numeracy requirements of the work being performed and the needs of the candidate.

Assessment must occur in workplace operational situations. Where this is not appropriate, assessment must occur in simulated workplace operational situations that reflect workplace conditions. Resources for assessment must include access to:

- a range of relevant exercises, case studies and/or other simulations
- relevant and appropriate materials, tools, equipment and personal protective equipment currently used in industry applicable documentation including workplace procedures, industry standards, equipment specifications, regulations, codes of practice and operation manuals.

Links

Companion Volume implementation guides are found in VETNet - https://vetnet.gov.au/Pages/TrainingDocs.aspx?q=1715b9fa-e7bd-441c-bb8d-cf22c9c825a8

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UEPMNT412 Modify complex electrical equipment

Modification History

Release 1. This is the first release of this unit of competency in the UEP Generation Training Package.

Application

This unit involves the skills and knowledge required to undertake modifications of complex and High Voltage (H.V.) electrical equipment; this may include but is not limited to alterations, additions or adjustments.

Modifications are any changes to complex electrical equipment which may alter it from the manufacturers' specification, it can include alterations, additions or adjustments to complex and High Voltage (H.V.) electrical equipment to ensure they meet operational requirements.

Competency in this unit requires the ability to plan work, carry out complex electrical equipment modifications and to report on all completed work tasks. Individuals will, in general, work under supervision in an electrical, electronic and/or mechanical equipment repair workshop or onsite.

Power generation maintenance personnel are typically trained and authorised to receive permits to work.

No licensing, legislative or certification requirements apply to this unit at the time of publication.

Note: Workplace practice

The application of the skills and knowledge described in this unit of competency may require a licence or training permit to practice in the workplace, where work is carried out on gas and electrical installations. Additional and/or other conditions may apply under state and territory legislative and regulatory licensing requirements.

Pre-requisite Unit

UEPMNT350 Modify electrical equipment

UEENEEG108A Troubleshoot and repair faults in low voltage electrical apparatus and circuits

UEENEEE102A Fabricate, assemble and dismantle utilities industry components

UEENEEE104A Solve problems in D.C. circuits

UEENEEE105A Fix and secure electrotechnology equipment

UEENEEE107A Use drawings, diagrams, schedules, standards, codes and specifications

UEENEEG006A Solve problems in single and three phase low voltage machines

UEENEEG033A Solve problems in single and three phase low voltage electrical apparatus and circuits

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UEENEEG063A Arrange circuits, control and protection for general electrical installations

UEENEEG101A Solve problems in electromagnetic devices and related circuits

UEENEEG102A Solve problems in low voltage A.C. circuits

UEENEEG106A Terminate cables, cords and accessories for low voltage circuits

Competency Field

Maintenance

Unit Sector

Electricity generation

Elements and Performance Criteria

ELEMENTS	PERFORMANCE CRITERIA
Elements describe the essential outcomes.	Performance criteria describe the performance needed to demonstrate achievement of the element.
1 Plan and prepare for work	**1.1** Requirements including scope of work and assigned roles are identified and confirmed with appropriate personnel or by site inspection, in accordance with workplace procedures
	1.2 Work, Health and Safety (WHS)/Occupational Health and Safety (OHS) standards, legislative requirements, industry standards, codes of practice, manufacturers' specifications, environmental obligations and workplace procedures are reviewed in preparation for work
	1.3 Resources are obtained and inspected for compliance with job specification
	1.4 Relevant plans, drawings and manuals are selected and used, in accordance with workplace procedures
	1.5 Correct materials and components for work are obtained and inspected, in accordance with workplace procedures, for compliance with job specification
	1.6 Work is planned, sequenced and prioritised, in accordance with workplace procedures
	1.7 Potential hazards are identified and risk control

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		measures are selected and implemented, in accordance with workplace procedures
	1.8	Work area is prepared, in accordance with workplace procedures
2 Carry out modifications	**2.1**	Isolations are confirmed, where appropriate, in accordance with workplace procedures
	2.2	Complex electrical equipment is modified, in accordance with workplace procedures, plans, drawings and manuals
	2.3	Modifications are completed, in accordance with workplace procedures, without loss or damage to equipment
	2.4	Modified equipment is set up, in accordance with workplace procedures and manufacturers' specifications
	2.5	Final inspection is performed, in accordance with workplace procedures
3 Complete work	**3.1**	Work is completed and appropriate personnel are notified, in accordance with workplace procedures
	3.2	Work area is cleared of waste, cleaned, restored and secured, in accordance with workplace procedures
	3.3	Tools and equipment are cleaned, maintained and stored, in accordance with workplace procedures
	3.4	Work completion details are finalised, in accordance with workplace procedures

Foundation Skills

Foundation skills essential to performance are explicit in the performance criteria of this unit of competency.

Range of Conditions

Range is restricted to essential operating conditions and any other variables essential to the work environment.

Non-essential conditions may be found in the Companion Volume Implementation Guide.

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Unit Mapping Information

This unit replaces and is equivalent to UEPMNT412B Modify complex electrical equipment.

Links

Companion Volume implementation guides are found in VETNet - https://vetnet.gov.au/Pages/TrainingDocs.aspx?q=1715b9fa-e7bd-441c-bb8d-cf22c9c825a8

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Assessment Requirements for UEPMNT412 Modify complex electrical equipment

Modification History

Release 1. This is the first release of this unit of competency in the UEP Generation Training Package.

Performance Evidence

Evidence required to demonstrate competence in this unit must be relevant to and satisfy all the requirements of the elements, performance criteria and range of conditions on at least two separate occasions and includes:

- applying Work, Health and Safety (WHS)/Occupational Health and Safety (OHS) requirements including:
  - emergency procedures
  - hazard identification
  - risk control measures
  - safe working practices
- carrying out modifications
- communicating with personnel
- completing work as per scheduled requirements
- determining permit to work requirements
- employing test and measurement instruments
- implementing legislations, industry standards, codes of practice and regulations
- modifying complex electrical equipment using modification techniques using manufacturers' specifications, manuals and circuit plans
- planning for modification of complex electrical equipment work
- selecting materials
- utilising data analysis techniques and tools
- working with tools and equipment

Knowledge Evidence

Evidence required to demonstrate competence in this unit must be relevant to and satisfy all the requirements of the elements, performance criteria and range of conditions and includes knowledge of:

- complex electrical equipment and its operation
- equipment and materials
- generation plant and equipment, its location and operation
- isolations

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- legislation, industry standards, codes of practice and regulations
- manufacturers' specifications, circuit plans and manuals
- modifications of complex electrical equipment using modification techniques
- permit to work system
- test and measurement instruments
- typical arrangements of power production plant
- WHS/OHS legislated requirements including:
  - emergency procedures
  - hazard identification
  - risk control measures
  - safe working practices
- workplace documentation
- workplace policies and procedures

Assessment Conditions

As a minimum, assessors must satisfy applicable regulatory requirements, which include requirements in the Standards for Registered Training Organisations current at the time of assessment.

As a minimum, assessment must satisfy applicable regulatory requirements, which include requirements in the Standards for Registered Training Organisations current at the time of assessment.

Assessment processes and techniques must be appropriate to the language, literacy and numeracy requirements of the work being performed and the needs of the candidate.

Assessment must occur in workplace operational situations. Where this is not appropriate, assessment must occur in simulated workplace operational situations that reflect workplace conditions.

Resources for assessment must include access to:

- a range of relevant exercises, case studies and/or other simulations
- relevant and appropriate materials, tools, equipment and personal protective equipment currently used in industry
- applicable documentation including workplace procedures, industry standards, equipment specifications, regulations, codes of practice and operation manuals.

Links

Companion Volume implementation guides are found in VETNet - https://vetnet.gov.au/Pages/TrainingDocs.aspx?q=1715b9fa-e7bd-441c-bb8d-cf22c9c825a8

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UEPMNT414 Test and commission complex electrical equipment

Modification History

Release 1. This is the first release of this unit of competency in the UEP Generation Training Package.

Application

This unit involves the skills and knowledge required to conduct testing and commissioning of complex and High Voltage (H.V.) electrical wiring systems and equipment.

Commissioning and testing is the process of ensuring all systems and components of complex and High Voltage (H.V.) electrical wiring systems and equipment used within a power generation facility are working efficiently and safely according to operational requirements.

Competency in this unit requires the ability to plan work, test wiring systems in complex electrical equipment, test complex electrical equipment, commission complex electrical equipment and to report on all completed work tasks. Individuals will, in general, work under supervision in an electrical, electronic and/or mechanical equipment repair workshop or on site.

Power generation maintenance personnel are typically trained and authorised to receive permits to work.

No licensing, legislative or certification requirements apply to this unit at the time of publication.

Note: Workplace practice

The application of the skills and knowledge described in this unit of competency may require a licence or training permit to practice in the workplace, where work is carried out on gas and electrical installations. Additional and/or other conditions may apply under state and territory legislative and regulatory licensing requirements.

Pre-requisite Unit

UEPMNT351 Test and commission electrical equipment

UEENEEG108A Troubleshoot and repair faults in low voltage electrical apparatus and circuits

UEENEEE102A Fabricate, assemble and dismantle utilities industry components

UEENEEE104A Solve problems in D.C. circuits

UEENEEE105A Fix and secure electrotechnology equipment

UEENEEE107A Use drawings, diagrams, schedules, standards, codes and specifications

UEENEEG006A Solve problems in single and three phase low voltage machines

UEENEEG033A Solve problems in single and three phase low voltage electrical apparatus and circuits

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UEENEEG063A Arrange circuits, control and protection for general electrical installations

UEENEEG101A Solve problems in electromagnetic devices and related circuits

UEENEEG102A Solve problems in low voltage A.C. circuits

UEENEEG106A Terminate cables, cords and accessories for low voltage circuits

Competency Field

Maintenance

Unit Sector

Electricity generation

Elements and Performance Criteria

ELEMENTS	PERFORMANCE CRITERIA
Elements describe the essential outcomes.	Performance criteria describe the performance needed to demonstrate achievement of the element.
1 Plan and prepare for work	**1.1** Requirements including scope of work and assigned roles are identified and confirmed with appropriate personnel or by site inspection, in accordance with workplace procedures
	1.2 Work, Health and Safety (WHS)/Occupational Health and Safety (OHS) regulations, legislative requirements, industry standards, codes of practice, manufacturers' specifications, environmental obligations and workplace procedures are reviewed in preparation for work
	1.3 Resources are obtained and inspected for compliance with job specification
	1.4 Relevant plans, drawings and manuals are selected and used, in accordance with workplace procedures
	1.5 Correct materials and components for work are obtained and inspected, in accordance with workplace procedures, for compliance with job specification
	1.6 Work is planned, sequenced and prioritised, in accordance with workplace procedures
	1.7 Potential hazards are identified and risk control

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		measures are selected and implemented, in accordance with workplace procedures
	1.8	Work area is prepared, in accordance with workplace procedures
2 Test wiring systems	**2.1**	Isolations are confirmed, where appropriate, in accordance with workplace procedures
	2.2	Complex electrical equipment wiring systems are tested, in accordance with workplace procedures, plans, drawings and manuals
	2.3	Wiring systems, including enclosures or supports, are inspected prior to testing, in accordance with workplace procedures, to ensure absence of damage, defects and/or deterioration
	2.4	Fixed wiring is tested, in accordance with workplace procedures and results are documented to confirm compliance with job specification
3 Test complex electrical equipment	**3.1**	Isolations are confirmed, where appropriate, in accordance with workplace procedures
	3.2	Complex electrical equipment is tested, in accordance with workplace procedures, plans, drawings and manuals
	3.3	Test conditions are confirmed and complex electrical equipment is inspected, in accordance with workplace procedures, to ensure absence of damage, defects or deterioration
	3.4	Complex electrical equipment is tested using appropriate techniques, in accordance with workplace procedures
	3.5	Complex electrical equipment test results are documented, in accordance with workplace procedures, to confirm compliance with job specification
4 Commission complex electrical equipment	**4.1**	Isolations are confirmed, where appropriate, in accordance with workplace procedures
	4.2	Complex electrical equipment is commissioned, in accordance with workplace procedures, plans, drawings and manuals
	4.3	Complex electrical equipment is set up, in accordance with workplace procedures, operational requirements

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		and manufacturers' specifications
	4.4	Testing and monitoring procedures are followed, and results are monitored and documented to ensure equipment functions within manufactures' specifications
	4.5	Complex electrical equipment is commissioned, in accordance with workplace procedures
	4.6	Final inspection is carried out, as required, in accordance with workplace procedures
5 Complete work	**5.1**	Work is completed and appropriate personnel are notified, in accordance with workplace procedures
	5.2	Work area is cleared of waste, cleaned, restored and secured, in accordance with workplace procedures
	5.3	Tools and equipment are cleaned, maintained and stored, in accordance with workplace procedures
	5.4	Work completion details are finalised, in accordance with workplace procedures

Foundation Skills

Foundation skills essential to performance are explicit in the performance criteria of this unit of competency.

Range of Conditions

Range is restricted to essential operating conditions and any other variables essential to the work environment.

Non-essential conditions may be found in the Companion Volume Implementation Guide.

Unit Mapping Information

This unit replaces and is equivalent to UEPMNT414B Test and commission complex electrical equipment.

Links

Companion Volume implementation guides are found in VETNet - https://vetnet.gov.au/Pages/TrainingDocs.aspx?q=1715b9fa-e7bd-441c-bb8d-cf22c9c825a8

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Assessment Requirements for UEPMNT414 Test and commission complex electrical equipment

Modification History

Release 1. This is the first release of this unit of competency in the UEP Generation Training Package.

Performance Evidence

Evidence required to demonstrate competence in this unit must be relevant to and satisfy all the requirements of the elements, performance criteria and range of conditions on at least two separate occasions and includes:

- applying Work, Health and Safety (WHS)/Occupational Health and Safety (OHS) requirements including:
  - emergency procedures
  - hazard identification
  - risk control measures
  - safe working practices
- commissioning complex electrical equipment
- commissioning equipment using commissioning procedures
- communicating with personnel
- completing work as per scheduled requirements
- determining permit to work requirements
- employing data analysis techniques and tools
- implementing legislation, industry standards, codes of practice and regulations
- interpreting manufacturers' specifications and manuals
- performing isolations
- planning for testing and commissioning complex electrical equipment work
- selecting materials
- testing and inspecting wiring systems and monitoring equipment using testing techniques
- using manufacturers' specifications and manuals
- using tools and equipment
- utilising testing and measurement instruments

Knowledge Evidence

Evidence required to demonstrate competence in this unit must be relevant to and satisfy all the requirements of the elements, performance criteria and range of conditions and includes knowledge of:

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- commission and test techniques
- complex electrical equipment
- equipment and materials
- isolations
- legislation, industry standards, codes of practice and regulations
- manufacturers' specifications and manuals
- permit to work system
- plant and equipment, its location and operation
- test and measurement instruments
- typical arrangements of power production plant
- WHS/OHS legislated requirements including:
  - emergency procedures
  - hazard identification
  - risk control measures
  - safe working practices
- workplace documentation
- workplace policies and procedures

Assessment Conditions

As a minimum, assessors must satisfy applicable regulatory requirements, which include requirements in the Standards for Registered Training Organisations current at the time of assessment.

As a minimum, assessment must satisfy applicable regulatory requirements, which include requirements in the Standards for Registered Training Organisations current at the time of assessment.

Assessment processes and techniques must be appropriate to the language, literacy and numeracy requirements of the work being performed and the needs of the candidate.

Assessment must occur in workplace operational situations. Where this is not appropriate, assessment must occur in simulated workplace operational situations that reflect workplace conditions. Resources for assessment must include access to:

- a range of relevant exercises, case studies and/or other simulations
- relevant and appropriate materials, tools, equipment and personal protective equipment currently used in industry
- applicable documentation including workplace procedures, industry standards, equipment specifications, regulations, codes of practice and operation manuals.

Links

Companion Volume implementation guides are found in VETNet - https://vetnet.gov.au/Pages/TrainingDocs.aspx?q=1715b9fa-e7bd-441c-bb8d-cf22c9c825a8

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UEPMNT417 Inspect electrical generators and diagnose faults

Modification History

Release 1. This is the first release of this unit of competency in the UEP Generation Training Package.

Application

This unit involves the skills and knowledge required to conduct inspections and diagnose faults in electrical generators.

An inspection is a critical appraisal involving the examination, measurement, testing, gauging, and comparison of electrical generator components and parts. An inspection will determine if an electrical generator is in a safe and reliable working condition and if it conforms to the manufactures' specifications.

Competency in this unit requires the ability to plan work, carry out electrical generator inspections, evaluate and analyse inspection results, prepare remedial action plans and update documentation. Individuals will, in general, work under supervision in an electrical, electronic and/or mechanical equipment repair workshop or on site.

Power generation maintenance personnel are typically trained and authorised to receive permits to work.

No licensing, legislative or certification requirements apply to this unit at the time of publication.

Note: Workplace practice

The application of the skills and knowledge described in this unit of competency may require a licence or training permit to practice in the workplace, where work is carried out on gas and electrical installations. Additional and/or other conditions may apply under state and territory legislative and regulatory licensing requirements.

Pre-requisite Unit

UEPMNT351 Test and commission electrical equipment

UEENEEG108A Troubleshoot and repair faults in low voltage electrical apparatus and circuits

UEENEEE102A Fabricate, assemble and dismantle utilities industry components

UEENEEE104A Solve problems in D.C. circuits

UEENEEE105A Fix and secure electrotechnology equipment

UEENEEE107A Use drawings, diagrams, schedules, standards, codes and specifications

UEENEEG006A Solve problems in single and three phase low voltage machines

UEENEEG033A Solve problems in single and three phase low voltage electrical apparatus and circuits

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UEENEEG063A Arrange circuits, control and protection for general electrical installations

UEENEEG101A Solve problems in electromagnetic devices and related circuits

UEENEEG102A Solve problems in low voltage A.C. circuits

UEENEEG106A Terminate cables, cords and accessories for low voltage circuits

Competency Field

Maintenance

Unit Sector

Electricity generation

Elements and Performance Criteria

ELEMENTS	PERFORMANCE CRITERIA
Elements describe the essential outcomes.	Performance criteria describe the performance needed to demonstrate achievement of the element.
1 Plan and prepare for work	**1.1** Maintenance and operating history of electrical generator is obtained and reviewed, in accordance with workplace procedures
	1.2 Work, Health and Safety (WHS)/Occupational Health and Safety (OHS) standards, legislative requirements, industry standards, codes of practice, manufacturers' specifications and workplace procedures are reviewed in preparation for work
	1.3 Inspection of electrical generator is planned, sequenced and prioritised, in accordance with workplace and technical procedures
	1.4 Resources are obtained and inspected for compliance with job specification
	1.5 Relevant plans, drawings and manuals are selected and used, in accordance with workplace procedures
	1.6 Potential hazards are identified and risk control measures are selected and implemented, in accordance with workplace procedures and inspection plan
2 Carry out generator	**2.1** Isolations are confirmed, where appropriate, in

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inspection		accordance with workplace procedures
	2.2	Electrical generator is inspected using appropriate manuals, drawings and manuals, in accordance with workplace procedures
	2.3	Additional tests or inspections, if required, are identified and completed, in accordance with workplace procedures
	2.4	Final inspection is carried out, in accordance with workplace procedures
3 Evaluate and analyse inspection results	**3.1**	Test or inspection results and data are analysed, in accordance with workplace procedures
	3.2	Specialist assistance is sought, if required, on completion of analysis
4 Prepare remedial action plan	**4.1**	Remedial action plan, if required, is prepared, in accordance with workplace procedures
	4.2	Remedial actions are followed up, in accordance with workplace procedures, and are checked by appropriate personnel
5 Update documentation	**5.1**	Relevant records and documentation are updated, in accordance with workplace procedures
	5.2	Reports and documentation are forwarded to appropriate personnel, in accordance with workplace procedures

Foundation Skills

Foundation skills essential to performance are explicit in the performance criteria of this unit of competency.

Range of Conditions

Range is restricted to essential operating conditions and any other variables essential to the work environment.

Non-essential conditions may be found in the Companion Volume Implementation Guide.

Unit Mapping Information

This unit replaces and is equivalent to UEPMNT417B Inspect electrical generators and diagnose

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faults.

Links

Companion Volume implementation guides are found in VETNet - https://vetnet.gov.au/Pages/TrainingDocs.aspx?q=1715b9fa-e7bd-441c-bb8d-cf22c9c825a8

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Assessment Requirements for UEPMNT417 Inspect electrical generators and diagnose faults

Modification History

Release 1. This is the first release of this unit of competency in the UEP Generation Training Package.

Performance Evidence

Evidence required to demonstrate competence in this unit must be relevant to and satisfy all the requirements of the elements, performance criteria and range of conditions on at least two separate occasions and includes:

- analysing inspection results and making recommendations
- applying Work, Health and Safety (WHS)/Occupational Health and Safety (OHS) requirements including:
  - emergency procedures
  - hazard identification
  - risk control measures
  - safe working practices
- carrying out generator inspection
- communicating with personnel
- determining permit to work requirements
- evaluating and analysing inspection results
- implementing regulations, industry standards, codes of practice and legislation
- inspecting electrical generators and diagnosing faults
- interpreting manufacturers' specifications and manuals
- planning for electrical inspection of generators and the diagnosis of fault work
- preparing remedial action plans
- updating documentation
- utilising data analysis techniques and tools
- working with inspection techniques and procedures

Knowledge Evidence

Evidence required to demonstrate competence in this unit must be relevant to and satisfy all the requirements of the elements, performance criteria and range of conditions and includes knowledge of:

- generator types and characteristics
- inspections of electrical generators and diagnosing faults

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- isolations
- legislation, industry standards, codes of practice and regulations
- manufacturers' specifications and manuals
- permit to work system
- plant and equipment, its location and operation
- typical arrangements of power production plant
- WHS/OHS legislated requirements including:
  - emergency procedures
  - hazard identification
  - risk control measures
  - safe working practices
- workplace documentation
- workplace policies and procedures

Assessment Conditions

As a minimum, assessors must satisfy applicable regulatory requirements, which include requirements in the Standards for Registered Training Organisations current at the time of assessment.

As a minimum, assessment must satisfy applicable regulatory requirements, which include requirements in the Standards for Registered Training Organisations current at the time of assessment.

Assessment processes and techniques must be appropriate to the language, literacy and numeracy requirements of the work being performed and the needs of the candidate.

Assessment must occur in workplace operational situations. Where this is not appropriate, assessment must occur in simulated workplace operational situations that reflect workplace conditions. Resources for assessment must include access to:

- a range of relevant exercises, case studies and/or other simulations
- relevant and appropriate materials, tools, equipment and personal protective equipment currently used in industry
- applicable documentation including workplace procedures, industry standards, equipment specifications, regulations, codes of practice and operation manuals.

Links

Companion Volume implementation guides are found in VETNet - https://vetnet.gov.au/Pages/TrainingDocs.aspx?q=1715b9fa-e7bd-441c-bb8d-cf22c9c825a8

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UEPMNT419 Perform civil drafting

Modification History

Release 1. This is the first release of this unit of competency in the UEP Generation Training Package.

Application

This unit involves the skills and knowledge required to perform civil drafting and to use drawing equipment for the production of sectional, schematic and plan drawings.

Drafting is the creation of a technical drawing, schematic or plan of a mechanical device or structure for the purpose of determining how they have been created or works. Drafting can be completed by hand or with specially designed computer programs.

Competency in this unit requires the ability to prepare for drafting, perform civil drafting and complete work tasks. Individuals will, in general, work as a maintenance operative in a power generation facility.

No licensing, legislative or certification requirements apply to this unit at the time of publication.

Note: Workplace practice

The application of the skills and knowledge described in this unit of competency may require a licence or training permit to practice in the workplace, where work is carried out on gas and electrical installations. Additional and/or other conditions may apply under state and territory legislative and regulatory licensing requirements.

Pre-requisite Unit

UEENEEE107A Use drawings, diagrams, schedules, standards, codes and specifications

MEM09002B Interpret technical drawing

Competency Field

Maintenance

Unit Sector

Electricity generation

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Elements and Performance Criteria

ELEMENTS	PERFORMANCE CRITERIA
Elements describe the essential outcomes.	Performance criteria describe the performance needed to demonstrate achievement of the element.
1 Prepare for drafting	**1.1** Requirements including scope of work are identified and confirmed with appropriate personnel or by site inspection, in accordance with workplace procedures
	1.2 Work, Health and Safety (WHS)/Occupational Health and Safety (OHS) regulations, legislative requirements, industry standards, codes of practice, manufacturers' specifications, environmental obligations and workplace procedures are reviewed in preparation for work
	1.3 Relevant plans, drawings and manuals are selected and used, in accordance with workplace procedures
2 Perform drafting	**2.1** Civil structures and their assembly are drawn using sectional representations, in accordance with specification requirements
	2.2 Civil structures are drawn to highlight critical features, in accordance workplace procedures and manufacturers' specifications
	2.3 Progressive tolerance calculations are performed, in accordance with workplace procedures, to ensure functional operation of civil structures
	2.4 Dimensions are selected to ensure fit of civil components, in accordance with specification requirements
	2.5 Civil components are selected from manufacturers' catalogue, in accordance with workplace procedures, to meet specified functions
	2.6 Pictorial drawings such as isometrics are produced, as requested, in accordance with workplace procedures and industry standards
3 Complete work	**3.1** Drawings are checked to ensure that civil structure assembly is possible, in accordance with specification requirements
	3.2 Drawings are produced, registered and recorded, in

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accordance with workplace documentation procedures

3.3 Relevant personnel are notified, and existing drawings and specification sheets are updated, as required

Foundation Skills

Foundation skills essential to performance are explicit in the performance criteria of this unit of competency.

Range of Conditions

Range is restricted to essential operating conditions and any other variables essential to the work environment.

Non-essential conditions may be found in the Companion Volume Implementation Guide.

Unit Mapping Information

This unit replaces and is equivalent to UEPMNT419B Perform civil drafting.

Links

Companion Volume implementation guides are found in VETNet - https://vetnet.gov.au/Pages/TrainingDocs.aspx?q=1715b9fa-e7bd-441c-bb8d-cf22c9c825a8

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Assessment Requirements for UEPMNT419 Perform civil drafting

Modification History

Release 1. This is the first release of this unit of competency in the UEP Generation Training Package.

Performance Evidence

Evidence required to demonstrate competence in this unit must be relevant to and satisfy all the requirements of the elements, performance criteria and range of conditions on at least two separate occasions and includes:

- applying Work, Health and Safety (WHS)/Occupational Health and Safety (OHS) requirements including:
  - emergency procedures
  - hazard identification
  - risk control measures
  - safe working practices
- communicating with personnel
- completing work as per scheduled requirements
- implementing legislation, industry standards, codes of practice and regulations
- performing drafting of civil structures
- preparing for drafting
- using technical drawings, plans, manufacturers' specifications and manuals
- utilising drafting principles including using civil drawing symbols
- working with computer aided drawing systems and equipment

Knowledge Evidence

Evidence required to demonstrate competence in this unit must be relevant to and satisfy all the requirements of the elements, performance criteria and range of conditions and includes knowledge of:

- civil drawing symbols
- concepts and principles of drafting
- equipment for drawing and computer aided drawing systems
- legislation, industry standards, codes of practice and regulations
- technical drawings, plans, manufacturers' specifications and manuals
- typical arrangements of power production plant
- WHS/OHS legislated requirements including:

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  - emergency procedures
  - hazard identification
  - risk control measures
  - safe working practices
- workplace documentation
- workplace policies and procedures

Assessment Conditions

As a minimum, assessors must satisfy applicable regulatory requirements, which include requirements in the Standards for Registered Training Organisations current at the time of assessment.

As a minimum, assessment must satisfy applicable regulatory requirements, which include requirements in the Standards for Registered Training Organisations current at the time of assessment.

Assessment processes and techniques must be appropriate to the language, literacy and numeracy requirements of the work being performed and the needs of the candidate.

Assessment must occur in workplace operational situations. Where this is not appropriate, assessment must occur in simulated workplace operational situations that reflect workplace conditions.

Resources for assessment must include access to:

- a range of relevant exercises, case studies and/or other simulations
- relevant and appropriate materials, tools, equipment and personal protective equipment currently used in industry
- applicable documentation including workplace procedures, industry standards, equipment specifications, regulations, codes of practice and operation manuals.

Links

Companion Volume implementation guides are found in VETNet - https://vetnet.gov.au/Pages/TrainingDocs.aspx?q=1715b9fa-e7bd-441c-bb8d-cf22c9c825a8

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UEPMNT421 Conduct technical inspection of process plant and equipment

Modification History

Release 1. This is the first release of this unit of competency in the UEP Generation Training Package.

Application

This unit involves the skills and knowledge required to conduct a technical inspection of process generation plant, equipment and associated infrastructure.

An inspection is an organised examination or formal evaluation of power generation plant and equipment, it includes verifying compliance with technical specifications, taking measurements and performing tests.

Competency in this unit requires the ability to prepare for an inspection of power generation plant, inspection of power generation plant, analysing inspection results and updating documentation. Individuals will, in general, work as a maintenance operative in a power generation facility.

Power generation maintenance personnel are typically trained and authorised to receive permits to work.

No licensing, legislative or certification requirements apply to this unit at the time of publication.

Note: Workplace practice

The application of the skills and knowledge described in this unit of competency may require a licence or training permit to practice in the workplace, where work is carried out on gas and electrical installations. Additional and/or other conditions may apply under state and territory legislative and regulatory licensing requirements.

Pre-requisite Unit

UEPMNT351 Test and commission electrical equipment

UEENEEG108A Troubleshoot and repair faults in low voltage electrical apparatus and circuits

UEENEEE102A Fabricate, assemble and dismantle utilities industry components

UEENEEE104A Solve problems in D.C. circuits

UEENEEE105A Fix and secure electrotechnology equipment

UEENEEE107A Use drawings, diagrams, schedules, standards, codes and specifications

UEENEEG006A Solve problems in single and three phase low voltage machines

UEENEEG033A Solve problems in single and three phase low voltage electrical apparatus and

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circuits

UEENEEG063A Arrange circuits, control and protection for general electrical installations

UEENEEG101A Solve problems in electromagnetic devices and related circuits

UEENEEG102A Solve problems in low voltage A.C. circuits

UEENEEG106A Terminate cables, cords and accessories for low voltage circuits

Competency Field

Maintenance

Unit Sector

Electricity generation

Elements and Performance Criteria

ELEMENTS	PERFORMANCE CRITERIA
Elements describe the essential outcomes.	Performance criteria describe the performance needed to demonstrate achievement of the element.
1 Prepare for inspection process plant	**1.1** Short term maintenance and operating history is identified and obtained from authorised personnel
	1.2 Work, Health and Safety (WHS)/Occupational Health and Safety (OHS) regulations, legislative requirements, industry standards, codes of practice, manufacturers' specifications and workplace procedures are reviewed in preparation for work
	1.3 Deviations from normal operational parameters of process plant, equipment and associated infrastructure are identified
	1.4 Potential options for cause of deviations are established, in accordance with workplace procedures
	1.5 Needs and outcomes of process plant inspections or testing are defined, in accordance with workplace procedures
	1.6 Method sheets, check sheets and isolation instructions are obtained, in accordance with workplace procedures

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	1.7	Technical procedures are reviewed and adapted, as required, in accordance with workplace procedures
2 Inspect process plant	**2.1**	Process plant is correctly identified, in accordance with workplace procedures
	2.2	Process plant's operational status is identified, in accordance with workplace procedures
	2.3	Inspection work is carried out, in accordance with workplace procedures, legislative requirements and industry standards
	2.4	Inspection methods are followed, in accordance with workplace procedures
	2.5	Relevant documentation is completed, in accordance with workplace procedures
	2.6	Additional tests or inspections are identified, in accordance with workplace procedures
	2.7	Process plant and/or equipment is left in a safe condition, in accordance with workplace procedures
	2.8	Process plant and/or equipment availability is declared, in accordance with workplace procedures
	2.9	Specialist assistance is sought, in accordance with workplace procedures, during a technical inspection
3 Analyse inspection results	**3.1**	Testing and inspection results are analysed
	3.2	Causes for deviations from normal operation are identified
4 Prepare remedial action plan	**4.1**	Action plan is prepared for any required remedial action on process plant, equipment and associated infrastructure
	4.2	Remedial action is checked for implementation effectiveness, in accordance with workplace procedures
5 Update documentation	**5.1**	Records and documentation is updated, in accordance with legislative requirements, industry standards and workplace procedures
	5.2	Testing and inspection results, including reports are forwarded to designated personnel

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Foundation Skills

Foundation skills essential to performance are explicit in the performance criteria of this unit of competency.

Range of Conditions

Range is restricted to essential operating conditions and any other variables essential to the work environment.

Non-essential conditions may be found in the Companion Volume Implementation Guide.

Unit Mapping Information

This unit replaces and is equivalent to UEPMNT421B Conduct technical inspection of process plant and equipment.

Links

Companion Volume implementation guides are found in VETNet - https://vetnet.gov.au/Pages/TrainingDocs.aspx?q=1715b9fa-e7bd-441c-bb8d-cf22c9c825a8

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Assessment Requirements for UEPMNT421 Conduct technical inspection of process plant and equipment

Modification History

Release 1. This is the first release of this unit of competency in the UEP Generation Training Package.

Performance Evidence

Evidence required to demonstrate competence in this unit must be relevant to and satisfy all the requirements of the elements, performance criteria and range of conditions on at least two separate occasions and includes:

- analysing inspection results
- analysing with data analysis techniques and tools
- applying Work, Health and Safety (WHS)/Occupational Health and Safety (OHS) requirements including:
  - emergency procedures
  - hazard identification
  - risk control measures
  - safe working practices
- communicating with personnel
- comparing components against drawings, manuals and modules
- determining power generation operating parameters and process plant status
- identifying abnormal power generation plant operating conditions including process plant
- implementing legislation, industry standards, codes of practice and regulations
- inspecting process plant
- locating process plant and equipment at worksite
- meeting permit to work requirements
- organising a remedial action plan
- preparing for inspection
- recognising worn, damaged or seized components
- updating documentation using recording procedures
- using manufacturers' specifications and manuals
- utilising testing and inspection techniques
- working with Safety Data Sheets (SDS)/Material Safety Data Sheets (MSDS)

Knowledge Evidence

Evidence required to demonstrate competence in this unit must be relevant to and satisfy all the requirements of the elements, performance criteria and range of conditions and includes

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knowledge of:

- data analysis techniques and tools
- inspection and test procedures
- legislation, industry standards, codes of practice and regulations
- manufacturers' specifications and manuals
- permit to work system
- power generation plant operating parameters including process plant
- process plant and equipment, its location and operation
- process plant status
- Safety Data Sheets (SDS)/Material Safety Data Sheets (MSDS)
- test equipment
- typical arrangements of power production plant
- WHS/OHS legislated requirements including:
  - emergency procedures
  - hazard identification
  - risk control measures
  - safe working practices
- workplace documentation
- workplace policies and procedures
- worn, damaged or faulty process plant and equipment

Assessment Conditions

As a minimum, assessors must satisfy applicable regulatory requirements, which include requirements in the Standards for Registered Training Organisations current at the time of assessment.

As a minimum, assessment must satisfy applicable regulatory requirements, which include requirements in the Standards for Registered Training Organisations current at the time of assessment.

Assessment processes and techniques must be appropriate to the language, literacy and numeracy requirements of the work being performed and the needs of the candidate.

Assessment must occur in workplace operational situations. Where this is not appropriate, assessment must occur in simulated workplace operational situations that reflect workplace conditions.

Resources for assessment must include access to:

- a range of relevant exercises, case studies and/or other simulations
- relevant and appropriate materials, tools, equipment and personal protective equipment currently used in industry
- applicable documentation including workplace procedures, industry standards, equipment specifications, regulations, codes of practice and operation manuals.

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Links

Companion Volume implementation guides are found in VETNet - https://vetnet.gov.au/Pages/TrainingDocs.aspx?q=1715b9fa-e7bd-441c-bb8d-cf22c9c825a8

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UEPMNT422 Conduct performance testing on process plant and equipment

Modification History

Release 1. This is the first release of this unit of competency in the UEP Generation Training Package.

Application

This unit involves the skills and knowledge required to conduct performance testing on process plant and equipment.

Performance testing is used to determine how power generation plant and equipment performs in terms of responsiveness and stability under specified workloads. It can also serve to investigate, measure, validate or verify other attributes such as scalability, reliability and resource usage.

Competency in this unit requires the ability to plan and prepare for performance tests, undertake performance tests and collect data, evaluate and analyse information and complete documentation. Individuals will, in general, work as a maintenance operative in a power generation facility.

Power generation maintenance personnel are typically trained and authorised to receive permits to work.

No licensing, legislative or certification requirements apply to this unit at the time of publication.

Note: Workplace practice

The application of the skills and knowledge described in this unit of competency may require a licence or training permit to practice in the workplace, where work is carried out on gas and electrical installations. Additional and/or other conditions may apply under state and territory legislative and regulatory licensing requirements.

Pre-requisite Unit

UEPMNT351 Test and commission electrical equipment

UEENEEG108A Troubleshoot and repair faults in low voltage electrical apparatus and circuits

UEENEEE102A Fabricate, assemble and dismantle utilities industry components

UEENEEE104A Solve problems in D.C. circuits

UEENEEE105A Fix and secure electrotechnology equipment

UEENEEE107A Use drawings, diagrams, schedules, standards, codes and specifications

UEENEEG006A Solve problems in single and three phase low voltage machines

UEENEEG033A Solve problems in single and three phase low voltage electrical apparatus and

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circuits

UEENEEG063A Arrange circuits, control and protection for general electrical installations

UEENEEG101A Solve problems in electromagnetic devices and related circuits

UEENEEG102A Solve problems in low voltage A.C. circuits

UEENEEG106A Terminate cables, cords and accessories for low voltage circuits

Competency Field

Maintenance

Unit Sector

Electricity generation

Elements and Performance Criteria

ELEMENTS	PERFORMANCE CRITERIA
Elements describe the essential outcomes.	Performance criteria describe the performance needed to demonstrate achievement of the element.
1 Plan and prepare for performance test	**1.1** Work request is received and appropriate method of testing is determined, in accordance with legislative requirements, industry standards and workplace procedures
	1.2 Safety and process plant issues are identified, in accordance with workplace procedures
	1.3 Specialist assistance and personnel are arranged, in accordance with workplace procedures
	1.4 Tools and equipment are identified and acquired, in accordance with workplace procedures
	1.5 Test equipment is calibrated as specified in industry standards, manufacturers' specifications and workplace procedures
	1.6 Performance test requirements are determined and planned, in accordance with manufacturers' specifications and workplace procedures
	1.7 Process plant is identified and its' status prior to the test is established, in accordance with workplace procedures

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		and from appropriate personnel
	1.8	Authority to carry out work is obtained, in accordance with workplace procedures, process plant operating conditions and load requirements
2 Undertake performance test and collect data	**2.1**	Process plant is coordinated to initial operating state, ready for testing, in accordance with workplace procedures
	2.2	Performance tests and data collection are undertaken using appropriate techniques that ensure personnel safety and process plant integrity
	2.3	Performance tests are carried out, in accordance with workplace procedures
	2.4	Data is collected, in accordance with workplace procedures
	2.5	Performance test results are evaluated to accurately assess performance of process plant
	2.6	Process plant availability is declared, on completion of tests, in accordance with workplace procedures
3 Evaluate and analyse information	**3.1**	Process plant efficiency is evaluated, and analysed, in accordance with workplace procedures using data collected
	3.2	Process plant performance is measured against criteria or specifications, in accordance with workplace procedures
	3.3	Cause of abnormal process plant performance is identified by analysing technical and operational information
	3.4	Process plant integrity is maintained through consultation with appropriate personnel and reference to technical and operational documentation
	3.5	Performance test data is critiqued and validated, referencing technical information and applicable test procedure documentation
4 Complete documentation	**4.1**	Information and data is collated, in accordance with workplace procedures
	4.2	Reports and documentation are produced, in accordance

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with workplace procedures

4.3 Reports and documentation are presented to appropriate personnel, in accordance with workplace procedures, to facilitate implementation of recommendations

Foundation Skills

Foundation skills essential to performance are explicit in the performance criteria of this unit of competency.

Range of Conditions

Range is restricted to essential operating conditions and any other variables essential to the work environment.

Non-essential conditions may be found in the Companion Volume Implementation Guide.

Unit Mapping Information

This unit replaces and is equivalent to UEPMNT422B Conduct performance testing on process plant and equipment

Links

Companion Volume implementation guides are found in VETNet - https://vetnet.gov.au/Pages/TrainingDocs.aspx?q=1715b9fa-e7bd-441c-bb8d-cf22c9c825a8

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Assessment Requirements for UEPMNT422 Conduct performance testing on process plant and equipment

Modification History

Release 1. This is the first release of this unit of competency in the UEP Generation Training Package.

Performance Evidence

Evidence required to demonstrate competence in this unit must be relevant to and satisfy all the requirements of the elements, performance criteria and range of conditions on at least two separate occasions and includes:

- applying Work, Health and Safety (WHS)/Occupational Health and Safety (OHS) requirements including:
  - emergency procedures
  - hazard identification
  - risk control measures
  - safe working practices
- communicating with personnel
- completing documentation including writing reports
- determining permit to work requirements
- determining process plant performance
- evaluating and analysing data using data analysis techniques and tools
- identifying process plant status and operating parameters
- implementing legislation, industry standards, codes of practice and regulations
- planning and preparing for performance test
- producing reports and completing documentation
- recording, analysing and using data
- undertaking performance test and collecting data
- using manufacturers' specifications and manuals
- utilising performance testing and data collection techniques

Knowledge Evidence

Evidence required to demonstrate competence in this unit must be relevant to and satisfy all the requirements of the elements, performance criteria and range of conditions and includes knowledge of:

- evaluation and analysis methods and techniques
- legislation, industry standards, codes of practice and regulations

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- manufacturers' specifications and manuals
- performance tests and data collection techniques
- permit to work system
- process plant and equipment, its location and operation
- process plant operating parameters and performance characteristics
- report and documentation requirements
- typical arrangements of power production plant including operating parameters
- WHS/OHS legislated requirements including:
  - emergency procedures
  - hazard identification
  - risk control measures
  - safe working practices
- workplace documentation
- workplace policies and procedures

Assessment Conditions

As a minimum, assessors must satisfy applicable regulatory requirements, which include requirements in the Standards for Registered Training Organisations current at the time of assessment.

As a minimum, assessment must satisfy applicable regulatory requirements, which include requirements in the Standards for Registered Training Organisations current at the time of assessment.

Assessment processes and techniques must be appropriate to the language, literacy and numeracy requirements of the work being performed and the needs of the candidate.

Assessment must occur in workplace operational situations. Where this is not appropriate, assessment must occur in simulated workplace operational situations that reflect workplace conditions.

Resources for assessment must include access to:

- a range of relevant exercises, case studies and/or other simulations
- relevant and appropriate materials, tools, equipment and personal protective equipment currently used in industry
- applicable documentation including workplace procedures, industry standards, equipment specifications, regulations, codes of practice and operation manuals.

Links

Companion Volume implementation guides are found in VETNet - https://vetnet.gov.au/Pages/TrainingDocs.aspx?q=1715b9fa-e7bd-441c-bb8d-cf22c9c825a8

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UEPMNT425 Maintain complex instrumentation equipment

Modification History

Release 1. This is the first release of this unit of competency in the UEP Generation Training Package.

Application

This unit involves the skills and knowledge required to conduct maintenance of complex instrumentation equipment including, but not limited to, multi-loop equipment such as signal characterising, analogue control equipment, microprocessor controls such as programmable logic, laboratory and industrial analysers, ultrasonic and nucleonic equipment.

Maintenance is an essential part of the ongoing care and upkeep of complex instrumentation equipment that is used to measure, monitor, automate and control processes and equipment in a power generation facility.

Competency in this unit requires the ability to plan work, carry out complex instrumentation equipment maintenance and to report on all completed work tasks. Individuals will, in general, work under supervision in an electrical, electronic and/or mechanical equipment repair workshop or onsite.

Power generation maintenance personnel are typically trained and authorised to receive permits to work

No licensing, legislative or certification requirements apply to this unit at the time of publication.

Note: Workplace practice

The application of the skills and knowledge described in this unit of competency may require a licence or training permit to practice in the workplace, where work is carried out on gas and electrical installations. Additional and/or other conditions may apply under state and territory legislative and regulatory licensing requirements.

Pre-requisite Unit

UEPMNT356 Maintain instrumentation equipment

UEENEEI001B Install and set up transducers and sensing devices

UEENEEE102A Fabricate, assemble and dismantle utilities industry components

UEENEEE105A Fix and secure electrotechnology equipment

UEENEEE107A Use drawings, diagrams, schedules, standards, codes and specifications

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Competency Field

Maintenance

Unit Sector

Electricity generation

Elements and Performance Criteria

ELEMENTS	PERFORMANCE CRITERIA
Elements describe the essential outcomes.	Performance criteria describe the performance needed to demonstrate achievement of the element.
1 Plan and prepare for work	**1.1** Requirements including scope of work and assigned roles are identified and confirmed with appropriate personnel or by site inspection, in accordance with workplace procedures
	1.2 Work, Health and Safety (WHS)/Occupational Health and Safety (OHS) regulations, legislative requirements, industry standards, codes of practice, manufacturers' specifications, environmental obligations and workplace procedures are reviewed in preparation for work
	1.3 Resources are obtained and inspected for compliance with job specification
	1.4 Relevant plans, drawings and manuals are selected and used, in accordance with workplace procedures
	1.5 Correct materials and components for work are obtained and inspected, in accordance with workplace procedures, for compliance with job specification
	1.6 Work is planned, sequenced and prioritised, in accordance with workplace procedures
	1.7 Potential hazards are identified and risk control measures are selected and implemented, in accordance with workplace procedures
	1.8 Work area is prepared, in accordance with workplace procedures
2 Carry out complex instrumentation	**2.1** Isolations are confirmed, where appropriate, in

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equipment maintenance		accordance with workplace procedures
	2.2	Complex instrumentation equipment is maintained, in accordance with workplace procedures, plans, drawings and manuals
	2.3	Calibration or adjustments are carried out, in accordance with workplace procedures, to ensure equipment operates safely within requirements
	2.4	Maintenance, calibration or adjustments are carried out, in accordance with workplace procedures, without loss or damage to other equipment
	2.5	Final inspection is carried out, in accordance with workplace procedures
3 Complete work	**3.1**	Work is completed and appropriate personnel are notified, in accordance with workplace procedures
	3.2	Work area is cleared of waste, cleaned, restored and secured, in accordance with workplace procedures
	3.3	Tools and equipment are cleaned, maintained and stored, in accordance with workplace procedures
	3.4	Work completion details are finalised, in accordance with workplace procedures

Foundation Skills

Foundation skills essential to performance are explicit in the performance criteria of this unit of competency.

Range of Conditions

Range is restricted to essential operating conditions and any other variables essential to the work environment.

Non-essential conditions may be found in the Companion Volume Implementation Guide.

Unit Mapping Information

This unit replaces and is equivalent to UEPMNT425B Maintain complex instrumentation equipment.

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Links

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Assessment Requirements for UEPMNT425 Maintain complex instrumentation equipment

Modification History

Release 1. This is the first release of this unit of competency in the UEP Generation Training Package.

Performance Evidence

Evidence required to demonstrate competence in this unit must be relevant to and satisfy all the requirements of the elements, performance criteria and range of conditions on at least two separate occasions and includes:

- applying Work, Health and Safety (WHS)/Occupational Health and Safety (OHS) requirements including:
  - emergency procedures
  - hazard identification
  - risk control measures
  - safe working practices
- carrying out maintenance using maintenance techniques and procedures
- communicating with personnel
- completing work and finalising completion details
- determining permit to work requirements
- implementing regulations, industry standards, codes of practice and legislation
- installing electronic instrumentation equipment
- interpreting manufacturers' specifications and manuals
- performing tests with test and measurement instruments
- planning for maintenance of complex instrumentation equipment work
- selecting materials
- using tools and equipment
- utilising instrument calibration techniques
- working with data analysis techniques and tools

Knowledge Evidence

Evidence required to demonstrate competence in this unit must be relevant to and satisfy all the requirements of the elements, performance criteria and range of conditions and includes knowledge of:

- complex instrument equipment
- equipment and materials

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- installing electronic instrumentation equipment
- instrument calibration techniques
- isolations
- legislation, industry standards, codes of practice and regulations
- maintenance techniques
- manufacturers' specifications and manuals
- permit to work system
- plant and equipment, its location and operation
- test and measurement instruments
- typical arrangements of power production plant
- WHS/OHS legislated requirements including:
  - emergency procedures
  - hazard identification
  - risk control measures
  - safe working practices
- workplace documentation
- workplace policies and procedures

Assessment Conditions

As a minimum, assessors must satisfy applicable regulatory requirements, which include requirements in the Standards for Registered Training Organisations current at the time of assessment.

As a minimum, assessment must satisfy applicable regulatory requirements, which include requirements in the Standards for Registered Training Organisations current at the time of assessment.

Assessment processes and techniques must be appropriate to the language, literacy and numeracy requirements of the work being performed and the needs of the candidate.

Assessment must occur in workplace operational situations. Where this is not appropriate, assessment must occur in simulated workplace operational situations that reflect workplace conditions. Resources for assessment must include access to:

- a range of relevant exercises, case studies and/or other simulations
- relevant and appropriate materials, tools, equipment and personal protective equipment currently used in industry
- applicable documentation including workplace procedures, industry standards, equipment specifications, regulations, codes of practice and operation manuals.

Links

Companion Volume implementation guides are found in VETNet - https://vetnet.gov.au/Pages/TrainingDocs.aspx?q=1715b9fa-e7bd-441c-bb8d-cf22c9c825a8

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UEPMNT427 Diagnose and repair faults in complex instrumentation equipment

Modification History

Release 1. This is the first release of this unit of competency in the UEP Generation Training Package.

Application

This unit involves the skills and knowledge required to undertake the diagnosis and repair of complex instrumentation configuration including, but is not limited to signal characterising equipment, totaliser units, microprocessor control and interface equipment, laboratory and field analysers, ultrasonic and nucleonic equipment.

Diagnosing and repairing complex electronic instrumentation equipment that is used to measure, monitor, automate and control processes and equipment in a power generation facility includes the inspection, testing and verification of operational efficiency to identify possible repairs.

Competency in this unit requires the ability to plan work, verify complex electronic instrumentation equipment faults, find complex electronic instrumentation equipment faults, diagnose complex electronic instrumentation equipment faults, repair complex electronic instrumentation equipment faults and to report on all completed tasks. Individuals will, in general, work under supervision in an electrical, electronic and/or mechanical equipment repair workshop or on site.

Power generation maintenance personnel are typically trained and authorised to receive permits to work.

No licensing, legislative or certification requirements apply to this unit at the time of publication.

Note: Workplace practice

The application of the skills and knowledge described in this unit of competency may require a licence or training permit to practice in the workplace, where work is carried out on gas and electrical installations. Additional and/or other conditions may apply under state and territory legislative and regulatory licensing requirements.

Pre-requisite Unit

UEPMNT356 Maintain instrumentation equipment

UEENEEI001B Install and set up transducers and sensing devices

UEENEEE102A Fabricate, assemble and dismantle utilities industry components

UEENEEE105A Fix and secure electrotechnology equipment

UEENEEE107A Use drawings, diagrams, schedules, standards, codes and specifications

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Competency Field

Maintenance

Unit Sector

Electricity generation

Elements and Performance Criteria

ELEMENTS	PERFORMANCE CRITERIA
Elements describe the essential outcomes.	Performance criteria describe the performance needed to demonstrate achievement of the element.
1 Plan and prepare work	**1.1** Requirements including scope of work and assigned roles are identified and confirmed with appropriate personnel or by site inspection, in accordance with workplace procedures
	1.2 Work, Health and Safety (WHS)/Occupational Health and Safety (OHS) regulations, legislative requirements, industry standards, codes of practice, manufacturers' specifications, environmental obligations and workplace procedures are reviewed in preparation for work
	1.3 Resources are obtained and inspected for compliance with job specification
	1.4 Relevant plans, drawings and manuals are selected and used, in accordance with workplace procedures
	1.5 Correct materials and components are obtained and inspected, in accordance with workplace procedures, for compliance with job specification
	1.6 Work is planned, sequenced and prioritised, in accordance with workplace procedures
	1.7 Potential hazards are identified and risk control measures are selected and implemented, in accordance with workplace procedures
	1.8 Work area is prepared, in accordance with workplace procedures
2 Diagnosing complex instrumentation	**2.1** Normal performance and function of complex instrumentation equipment is ascertained, in accordance

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equipment fault		with workplace procedures
	2.2	Fault indicators, technical information and diagnostic techniques are used to verify reported faults in accordance with workplace procedures
	2.3	Faults are reproduced and monitored, if possible, in accordance with workplace procedures
3 Find complex instrumentation equipment fault	**3.1**	Isolations are confirmed, where appropriate, in accordance with workplace procedures and site requirements
	3.2	Complex instrumentation equipment components, wires, cables, terminations and support fixings are inspected, in accordance with workplace procedures, for faults
	3.3	Fault finding or diagnostic techniques are selected and used, in accordance with workplace procedures
	3.4	Components are disconnected to enable accurate test measurements of suspected faulty components, in accordance with workplace procedures, without back feed readings occurring
	3.5	Test and measurement instruments are used, in accordance with workplace procedures and manufacturers' specifications
4 Determine cause of complex instrumentation equipment fault	**4.1**	Appropriate personnel are consulted, if required, in accordance with workplace procedures
	4.2	Information from fault indicators and maintenance records are used, in accordance with workplace procedures
	4.3	Conclusions about the nature and cause of the complex instrumentation equipment fault are based on an analysis of available evidence, in accordance with workplace procedures
5 Repair complex instrumentation equipment fault	**5.1**	Isolations are confirmed, where appropriate, in accordance with workplace procedures and site requirements
	5.2	Faulty, worn or damaged components are repaired, in accordance with workplace procedures

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	5.3	Parts and components are selected and replaced, as required, in accordance with workplace procedures and manufactures' specifications
	5.4	Components disconnected for testing are reconnected, in accordance with workplace procedures and all terminations are checked to ensure they are electrically and mechanically sound
	5.5	All faults are repaired, in accordance with workplace procedures
	5.6	Final inspection is performed, in accordance with workplace procedures
6 Complete work	**6.1**	Work is completed and appropriate personnel are notified in accordance with workplace procedures
	6.2	Work area is cleared of waste, cleaned, restored and secured, in accordance with workplace procedures
	6.3	Tools and equipment are cleaned, maintained and stored, in accordance with workplace procedures
	6.4	Work completion details are finalised, in accordance with workplace procedures

Foundation Skills

Foundation skills essential to performance are explicit in the performance criteria of this unit of competency.

Range of Conditions

Range is restricted to essential operating conditions and any other variables essential to the work environment.

Non-essential conditions may be found in the Companion Volume Implementation Guide.

Unit Mapping Information

This unit replaces and is equivalent to UEPMNT427B Diagnose and repair faults in complex instrumentation equipment.

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Links

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Assessment Requirements for UEPMNT427 Diagnose and repair faults in complex instrumentation equipment

Modification History

Release 1. This is the first release of this unit of competency in the UEP Generation Training Package.

Performance Evidence

Evidence required to demonstrate competence in this unit must be relevant to and satisfy all the requirements of the elements, performance criteria and range of conditions on at least two separate occasions and includes:

- applying Work, Health and Safety (WHS)/Occupational Health and Safety (OHS) requirements including:
  - emergency procedures
  - hazard identification
  - risk control measures
  - safe working practices
- communicating with personnel
- completing work and finalising completion details
- determining cause of faults using fault finding and diagnostic techniques
- determining permit to work requirements
- finding faults
- identifying and selecting materials
- implementing regulations, industry standards, codes of practice and legislation
- interpreting manufacturers' specifications and manuals
- performing instrument calibration techniques
- planning diagnosing and repairing of faults in complex instrumentation equipment work
- repairing faults
- using tools and equipment
- utilising data analysis techniques and tools
- verifying faults
- working with test and measurement instruments

Knowledge Evidence

Evidence required to demonstrate competence in this unit must be relevant to and satisfy all the requirements of the elements, performance criteria and range of conditions and includes knowledge of:

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- complex instrumentation equipment
- diagnosis and repair of electronic instrumentation equipment plant and equipment, its location and operation
- equipment and material
- fault finding and diagnostic techniques
- instrument calibration techniques
- isolations
- legislation, industry standards, codes of practice and regulations
- manufacturers' specifications and manuals
- permit to work system
- repair techniques
- technical drawings and manufacturers' manuals
- test and measurement instruments
- typical arrangements of power production plant
- WHS/OHS legislated requirements including:
  - emergency procedures
  - hazard identification
  - risk control measures
  - safe working practices
- workplace documentation
- workplace policies and procedures

Assessment Conditions

As a minimum, assessors must satisfy applicable regulatory requirements, which include requirements in the Standards for Registered Training Organisations current at the time of assessment.

As a minimum, assessment must satisfy applicable regulatory requirements, which include requirements in the Standards for Registered Training Organisations current at the time of assessment.

Assessment processes and techniques must be appropriate to the language, literacy and numeracy requirements of the work being performed and the needs of the candidate.

Assessment must occur in workplace operational situations. Where this is not appropriate, assessment must occur in simulated workplace operational situations that reflect workplace conditions. Resources for assessment must include access to:

- a range of relevant exercises, case studies and/or other simulations
- relevant and appropriate materials, tools, equipment and personal protective equipment currently used in industry
- applicable documentation including workplace procedures, industry standards, equipment specifications, regulations, codes of practice and operation manuals.

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Companion Volume implementation guides are found in VETNet - https://vetnet.gov.au/Pages/TrainingDocs.aspx?q=1715b9fa-e7bd-441c-bb8d-cf22c9c825a8

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UEPMNT428 Modify complex instrumentation equipment

Modification History

Release 1. This is the first release of this unit of competency in the UEP Generation Training Package.

Application

This unit involves the skills and knowledge required to conduct modifications of complex instrumentation used in multi-loop configurations including characterising equipment, microprocessor control and interface equipment, as well as laboratory and field analysers, ultrasonic and nucleonic equipment.

Modifications can include any changes which may alter complex electronic instrumentation equipment that is used to measure, monitor, automate and control processes and equipment in a power generation facility from the manufacturers' specifications.

Competency in this unit requires the ability to plan work, carry out modifications to complex electronic instrumentation equipment and to report on all completed tasks. Individuals will, in general, work under supervision in an electrical, electronic and/or mechanical equipment repair workshop or on site.

Power generation maintenance personnel are typically trained and authorised to receive permits to work.

No licensing, legislative or certification requirements apply to this unit at the time of publication.

Note: Workplace practice

The application of the skills and knowledge described in this unit of competency may require a licence or training permit to practice in the workplace, where work is carried out on gas and electrical installations. Additional and/or other conditions may apply under state and territory legislative and regulatory licensing requirements.

Pre-requisite Unit

UEPMNT356 Maintain instrumentation equipment

UEENEEI001B Install and set up transducers and sensing devices

UEENEEE102A Fabricate, assemble and dismantle utilities industry components

UEENEEE105A Fix and secure electrotechnology equipment

UEENEEE107A Use drawings, diagrams, schedules, standards, codes and specifications

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Competency Field

Maintenance

Unit Sector

Electricity generation

Elements and Performance Criteria

ELEMENTS	PERFORMANCE CRITERIA
Elements describe the essential outcomes.	Performance criteria describe the performance needed to demonstrate achievement of the element.
1 Plan and prepare for work	**1.1** Requirements including scope of work and assigned roles are identified and confirmed with appropriate personnel or by site inspection, in accordance with workplace procedures
	1.2 Work, Health and Safety (WHS)/Occupational Health and Safety (OHS) regulations, legislative requirements, industry standards, codes of practice, manufacturers' specifications, environmental obligations and workplace procedures are reviewed in preparation for work
	1.3 Resources are obtained and inspected for compliance with job specification
	1.4 Relevant plans, drawings and manuals are selected and used, in accordance with workplace procedures
	1.5 Correct materials and components are obtained and inspected, in accordance with workplace procedures, for compliance with job specification
	1.6 Work is planned, sequenced and prioritised, in accordance with workplace procedures
	1.7 Potential hazards are identified and risk control measures are selected and implemented, in accordance with workplace procedures
	1.8 Work area is prepared, in accordance with workplace procedures
2 Carry out complex instrumentation	**2.1** Isolations are confirmed, where appropriate, in accordance with workplace procedures and site

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equipment modifications		requirements
	2.2	Complex instrumentation equipment is modified using appropriate plans, drawings and manuals, in accordance with workplace procedures
	2.3	Modifications are carried out, in accordance with workplace procedures, without damage or loss to other equipment
	2.4	Modified equipment is set up, in accordance with workplace procedures and manufacturers' specifications, to meet operational requirements
	2.5	Final inspection is performed, in accordance with workplace procedures
3 Complete work	**3.1**	Work is completed and appropriate personnel are notified, in accordance with workplace procedures
	3.2	Work area is cleared of waste, cleaned, restored and secured, in accordance with workplace procedures
	3.3	Tools and equipment are cleaned, maintained and stored, in accordance with workplace procedures
	3.4	Work completion details are finalised, in accordance with workplace procedures

Foundation Skills

Foundation skills essential to performance are explicit in the performance criteria of this unit of competency.

Range of Conditions

Range is restricted to essential operating conditions and any other variables essential to the work environment.

Non-essential conditions may be found in the Companion Volume Implementation Guide.

Unit Mapping Information

This unit replaces and is equivalent to UEPMNT428B Modify complex instrumentation equipment.

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Links

Companion Volume implementation guides are found in VETNet - https://vetnet.gov.au/Pages/TrainingDocs.aspx?q=1715b9fa-e7bd-441c-bb8d-cf22c9c825a8

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Assessment Requirements for UEPMNT428 Modify complex instrumentation equipment

Modification History

Release 1. This is the first release of this unit of competency in the UEP Generation Training Package.

Performance Evidence

Evidence required to demonstrate competence in this unit must be relevant to and satisfy all the requirements of the elements, performance criteria and range of conditions on at least two separate occasions and includes:

- applying Work, Health and Safety (WHS)/Occupational Health and Safety (OHS) requirements including:
  - emergency procedures
  - hazard identification
  - risk control measures
  - safe working practices
- carry out modifications using modification techniques and procedures
- communicating with personnel
- completing work and finalising completion details
- determining permit to work requirements
- identifying and selecting materials
- implementing regulations, industry standards, codes of practice and legislation
- interpreting manufacturers' specifications and manuals
- modifying complex instrumentation equipment
- planning for modification of complex instrumentation equipment work
- using tools and equipment
- utilising data analysis techniques and tools
- working with test and measurement instruments

Knowledge Evidence

Evidence required to demonstrate competence in this unit must be relevant to and satisfy all the requirements of the elements, performance criteria and range of conditions and includes knowledge of:

- equipment and materials
- instrumentation practices
- isolations

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- layout of generation plant and operation of equipment
- legislation, industry standards, codes of practice and regulations
- manufacturers' specifications and manuals
- modification techniques
- modifying complex instrumentation equipment
- permit to work system
- test and measurement instruments
- typical arrangements of power production plant
- WHS/OHS legislated requirements including:
  - emergency procedures
  - hazard identification
  - risk control measures
  - safe working practices
- workplace documentation
- workplace policies and procedures

Assessment Conditions

As a minimum, assessors must satisfy applicable regulatory requirements, which include requirements in the Standards for Registered Training Organisations current at the time of assessment.

As a minimum, assessment must satisfy applicable regulatory requirements, which include requirements in the Standards for Registered Training Organisations current at the time of assessment.

Assessment processes and techniques must be appropriate to the language, literacy and numeracy requirements of the work being performed and the needs of the candidate.

Assessment must occur in workplace operational situations. Where this is not appropriate, assessment must occur in simulated workplace operational situations that reflect workplace conditions. Resources for assessment must include access to:

- a range of relevant exercises, case studies and/or other simulations
- relevant and appropriate materials, tools, equipment and personal protective equipment currently used in industry
- applicable documentation including workplace procedures, industry standards, equipment specifications, regulations, codes of practice and operation manuals.

Links

Companion Volume implementation guides are found in VETNet - https://vetnet.gov.au/Pages/TrainingDocs.aspx?q=1715b9fa-e7bd-441c-bb8d-cf22c9c825a8

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UEPMNT430 Test and commission complex instrumentation equipment

Modification History

Release 1. This is the first release of this unit of competency in the UEP Generation Training Package.

Application

This unit involves the skills and knowledge required to conduct testing and commissioning of complex instrumentation used in multi-loop configurations, including but not limited to, laboratory and field analysers, totaliser units, signal characterising, microprocessor control, interface, ultrasonic and nucleonic equipment.

Commissioning and testing ensures that all complex instrumentation equipment, which is used to measure, monitor, automate and control processes in a power generation facility are working efficiently and meeting operational requirements.

Competency in this unit requires the ability to plan work, test complex instrumentation equipment wiring systems, test complex instrumentation equipment piping and tubing systems, test complex instrumentation equipment, commission complex instrumentation equipment and to report on all completed work tasks. Individuals will, in general, work under supervision in an electrical, electronic and/or mechanical equipment repair workshop or on site.

Power generation maintenance personnel are typically trained and authorised to receive permits to work.

No licensing, legislative or certification requirements apply to this unit at the time of publication.

Note: Workplace practice

The application of the skills and knowledge described in this unit of competency may require a licence or training permit to practice in the workplace, where work is carried out on gas and electrical installations. Additional and/or other conditions may apply under state and territory legislative and regulatory licensing requirements.

Pre-requisite Unit

UEPMNT359 Test and commission instrumentation systems

UEENEEI001B Install and set up transducers and sensing devices

UEENEEE102A Fabricate, assemble and dismantle utilities industry components

UEENEEE105A Fix and secure electrotechnology equipment

UEENEEE107A Use drawings, diagrams, schedules, standards, codes and specifications

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Competency Field

Maintenance

Unit Sector

Electricity generation

Elements and Performance Criteria

ELEMENTS	PERFORMANCE CRITERIA
Elements describe the essential outcomes.	Performance criteria describe the performance needed to demonstrate achievement of the element.
1 Plan and prepare for work	**1.1** Requirements including scope of work and assigned roles are identified and confirmed with appropriate personnel or by site inspection, in accordance with workplace procedures
	1.2 Work, Health and Safety (WHS)/Occupational Health and Safety (OHS) regulations, legislative requirements, industry standards, codes of practice, manufacturers' specifications, environmental obligations and workplace procedures are reviewed in preparation for work
	1.3 Resources are obtained and inspected for compliance with job specification
	1.4 Relevant plans, drawings and manuals are selected and used, in accordance with workplace procedures
	1.5 Correct materials and components for work are obtained and inspected for compliance with job specification
	1.6 Work is planned, sequenced and prioritised, in accordance with workplace procedures
	1.7 Potential hazards are identified and risk control measures are selected and implemented, in accordance with workplace procedures
	1.8 Work area is prepared, in accordance with workplace and site procedures
2 Test wiring systems	**2.1** Isolations for work are confirmed, where appropriate, in accordance with workplace procedures

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	2.2	Wiring systems are tested, in accordance with workplace procedures, plans, drawings and manuals
	2.3	Wiring systems, including enclosures and supports, are inspected prior to testing, in accordance with workplace procedures, to ensure absence of damage, defects and deterioration
	2.4	Fixed wiring is tested, in accordance with workplace procedures and results are documented to confirm compliance with job specification
3 Test piping and tubing systems	**3.1**	Isolations are confirmed, where appropriate, in accordance with workplace procedures
	3.2	Piping and tubing systems are tested, in accordance with workplace procedures, plans, drawings and manuals
	3.3	Piping and tubing systems, including enclosures and supports are inspected prior to testing, in accordance with workplace procedures, to ensure absence of damage, defects and deterioration
	3.4	Fixed piping and tubing is tested, in accordance with workplace procedures and results are documented to confirm compliance with job specification
4 Test equipment	**4.1**	Isolations are confirmed, where appropriate, in accordance with workplace procedures
	4.2	Complex instrumentation equipment is tested, in accordance with workplace procedures, using plans, drawings and manuals
	4.3	Test conditions are confirmed and complex instrumentation equipment is inspected, in accordance with workplace procedures to ensure absence of damage, defects or deterioration
	4.4	Complex instrumentation equipment is tested, in accordance with workplace procedures, using appropriate techniques
	4.5	Complex instrumentation equipment test results are documented to confirm compliance with job specification
5 Commission equipment	**5.1**	Isolations are confirmed, where appropriate, in accordance with workplace procedures

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5.2 Complex instrumentation equipment is commissioned, in accordance with workplace procedures, plans, drawings and manuals

5.3 Complex instrumentation equipment is set up, in accordance with workplace procedures, operational requirements and manufacturers' specifications

5.4 Testing and monitoring is implemented, in accordance with workplace procedures and the results are monitored and documented to ensure equipment operates to manufacturers' specifications

Foundation Skills

Foundation skills essential to performance are explicit in the performance criteria of this unit of competency.

Range of Conditions

Range is restricted to essential operating conditions and any other variables essential to the work environment.

Non-essential conditions may be found in the Companion Volume Implementation Guide.

Unit Mapping Information

This unit replaces and is equivalent to UEPMNT430B Test and commission complex instrumentation equipment.

Links

Companion Volume implementation guides are found in VETNet - https://vetnet.gov.au/Pages/TrainingDocs.aspx?q=1715b9fa-e7bd-441c-bb8d-cf22c9c825a8

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Assessment Requirements for UEPMNT430 Test and commission complex instrumentation equipment

Modification History

Release 1. This is the first release of this unit of competency in the UEP Generation Training Package.

Performance Evidence

Evidence required to demonstrate competence in this unit must be relevant to and satisfy all the requirements of the elements, performance criteria and range of conditions on at least two separate occasions and includes:

- applying Work, Health and Safety (WHS)/Occupational Health and Safety (OHS) requirements including:
  - emergency procedures
  - hazard identification
  - risk control measures
  - safe working practices
- commissioning complex instrumentation equipment using commissioning techniques and procedures
- communicating with personnel
- determining permit to work requirements
- finalising work completion details
- implementing regulations, industry standards, codes of practice and legislation
- inspecting and monitoring equipment
- interpreting manufacturers' specifications and manuals
- performing with instrument calibration techniques
- planning for the testing and commissioning of complex instrumentation equipment work
- selecting materials
- testing complex instrumentation equipment
- testing complex instrumentation wiring systems using testing techniques
- testing piping and tubing systems
- using tools and equipment
- utilising test and measurement instruments
- working with data analysis techniques and tools

Knowledge Evidence

Evidence required to demonstrate competence in this unit must be relevant to and satisfy all the requirements of the elements, performance criteria and range of conditions and includes

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knowledge of:

- characteristics and operation of complex instrumentation equipment
- equipment and materials
- generation plant and equipment, its location and operation
- instrument calibration techniques
- isolations
- legislation, industry standards, codes of practice and regulations
- manufacturers' specifications and manuals
- permit to work system
- test and commission complex instrumentation equipment
- test and commission techniques
- test and measurement instruments
- typical arrangements of power production plant
- WHS/OHS legislated requirements including:
  - emergency procedures
  - hazard identification
  - risk control measures
  - safe working practices
- workplace documentation
- workplace policies and procedures

Assessment Conditions

As a minimum, assessors must satisfy applicable regulatory requirements, which include requirements in the Standards for Registered Training Organisations current at the time of assessment.

As a minimum, assessment must satisfy applicable regulatory requirements, which include requirements in the Standards for Registered Training Organisations current at the time of assessment.

Assessment processes and techniques must be appropriate to the language, literacy and numeracy requirements of the work being performed and the needs of the candidate.

Assessment must occur in workplace operational situations. Where this is not appropriate, assessment must occur in simulated workplace operational situations that reflect workplace conditions.

Resources for assessment must include access to:

- a range of relevant exercises, case studies and/or other simulations
- relevant and appropriate materials, tools, equipment and personal protective equipment currently used in industry
- applicable documentation including workplace procedures, industry standards, equipment specifications, regulations, codes of practice and operation manuals.

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Links

Companion Volume implementation guides are found in VETNet - https://vetnet.gov.au/Pages/TrainingDocs.aspx?q=1715b9fa-e7bd-441c-bb8d-cf22c9c825a8

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UEPMNT433 Conduct routine generator electrical maintenance

Modification History

Release 1. This is the first release of this unit of competency in the UEP Generation Training Package.

Application

This unit involves the skills and knowledge required to undertake routine generator electrical maintenance tasks. Routine maintenance is the practice of monitoring, inspecting and performing reviews of generator electricals in a power generation facility on a regular basis to ensure the safe and efficient operation of all parts and components.

Competency in this unit requires the ability to plan work, carry out electrical generator inspections, evaluate/analyse inspection results, prepare remedial action plans and update documentation. Individuals will, in general, work under supervision in an electrical, electronic and/or mechanical equipment repair workshop or on site.

Power generation maintenance personnel are typically trained and authorised to receive permits to work.

No licensing, legislative or certification requirements apply to this unit at the time of publication.

Note: Workplace practice

The application of the skills and knowledge described in this unit of competency may require a licence or training permit to practice in the workplace, where work is carried out on gas and electrical installations. Additional and/or other conditions may apply under state and territory legislative and regulatory licensing requirements.

Pre-requisite Unit

UEPMNT346 Maintain electrical equipment

UEENEEG108A Troubleshoot and repair faults in low voltage electrical apparatus and circuits

UEENEEE102A Fabricate, assemble and dismantle utilities industry components

UEENEEE104A Solve problems in D.C. circuits

UEENEEE105A Fix and secure electrotechnology equipment

UEENEEE107A Use drawings, diagrams, schedules, standards, codes and specifications

UEENEEG006A Solve problems in single and three phase low voltage machines

UEENEEG033A Solve problems in single and three phase low voltage electrical apparatus and circuits

UEENEEG063A Arrange circuits, control and protection for general electrical installations

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UEENEEG101A Solve problems in electromagnetic devices and related circuits

UEENEEG102A Solve problems in low voltage A.C. circuits

UEENEEG106A Terminate cables, cords and accessories for low voltage circuits

Competency Field

Maintenance

Unit Sector

Electricity generation

Elements and Performance Criteria

ELEMENTS	PERFORMANCE CRITERIA
Elements describe the essential outcomes.	Performance criteria describe the performance needed to demonstrate achievement of the element.
1 Plan and prepare for work	**1.1** Requirements including scope of work and assigned roles are identified and confirmed with appropriate personnel or by site inspection, in accordance with workplace procedures
	1.2 Work, Health and Safety (WHS)/Occupational Health and Safety (OHS) regulations, legislative requirements, industry standards, codes of practice, manufacturers' specifications, environmental obligations and workplace procedures are reviewed in preparation for work
	1.3 Resources are obtained and inspected for compliance with job specification
	1.4 Relevant plans, drawings and manuals are selected and used, in accordance with workplace procedures
	1.5 Correct materials and components for work are obtained and inspected, in accordance with workplace procedures, for compliance with job specification
	1.6 Work is planned, sequenced and prioritised, in accordance with workplace procedures
	1.7 Potential hazards are identified and risk control measures are selected and implemented, in accordance

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		with workplace procedures
	1.8	Work area is prepared, in accordance with workplace and site procedures
2 Carry out routine generator electrical maintenance	**2.1**	Isolations are confirmed, where appropriate, in accordance with workplace procedures
	2.2	Generator electricals are maintained, in accordance with workplace procedures, plans, drawings and manuals
	2.3	Final inspection is carried out, in accordance with workplace procedures
.3 Complete work	**3.1**	Work is completed and appropriate personnel are notified, in accordance with workplace procedures
	3.2	Work area is cleared of waste, cleaned, restored and secured in accordance with workplace procedures
	3.3	Tools and equipment are cleaned, maintained and stored, in accordance with workplace procedures
	3.4	Work completion details are finalised, in accordance with workplace procedures

Foundation Skills

Foundation skills essential to performance are explicit in the performance criteria of this unit of competency.

Range of Conditions

Range is restricted to essential operating conditions and any other variables essential to the work environment.

Non-essential conditions may be found in the Companion Volume Implementation Guide.

Unit Mapping Information

This unit replaces and is equivalent to UEPMNT433B Conduct routine generator electrical maintenance.

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Links

Companion Volume implementation guides are found in VETNet - https://vetnet.gov.au/Pages/TrainingDocs.aspx?q=1715b9fa-e7bd-441c-bb8d-cf22c9c825a8

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Assessment Requirements for UEPMNT433 Conduct routine generator electrical maintenance

Modification History

Release 1. This is the first release of this unit of competency in the UEP Generation Training Package.

Performance Evidence

Evidence required to demonstrate competence in this unit must be relevant to and satisfy all the requirements of the elements, performance criteria and range of conditions on at least two separate occasions and includes:

- applying Work, Health and Safety (WHS)/Occupational Health and Safety (OHS) requirements including:
  - emergency procedures
  - hazard identification
  - risk control measures
  - safe working practices
- carrying out routine generator maintenance
- communicating with personnel
- completing work as per scheduled requirements
- determining work to permit requirements
- employing test and measurement instruments
- implementing legislation, industry standards, codes of practice and regulations
- performing generator electrical maintenance
- planning for routine generator electrical maintenance work
- selecting materials
- using maintenance techniques and procedures
- utilising data analysis techniques and tools
- working with tools and equipment

Knowledge Evidence

Evidence required to demonstrate competence in this unit must be relevant to and satisfy all the requirements of the elements, performance criteria and range of conditions and includes knowledge of:

- equipment and materials
- generator types and characteristics
- isolations

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- legislation, industry standards, codes of practice and regulations
- maintenance techniques
- manufacturers' specifications and manuals
- permit to work system
- routine generator electrical maintenance plant and equipment, its location and operation
- test and measurement instruments
- typical arrangements of power production plant
- WHS/OHS legislated requirements including:
  - emergency procedures
  - hazard identification
  - risk control measures
  - safe working practices
- workplace documentation
- workplace policies and procedures

Assessment Conditions

As a minimum, assessors must satisfy applicable regulatory requirements, which include requirements in the Standards for Registered Training Organisations current at the time of assessment.

As a minimum, assessment must satisfy applicable regulatory requirements, which include requirements in the Standards for Registered Training Organisations current at the time of assessment.

Assessment processes and techniques must be appropriate to the language, literacy and numeracy requirements of the work being performed and the needs of the candidate.

Assessment must occur in workplace operational situations. Where this is not appropriate, assessment must occur in simulated workplace operational situations that reflect workplace conditions.

Resources for assessment must include access to:

- a range of relevant exercises, case studies and/or other simulations
- relevant and appropriate materials, tools, equipment and personal protective equipment currently used in industry
- applicable documentation including workplace procedures, industry standards, equipment specifications, regulations, codes of practice and operation manuals.

Links

Companion Volume implementation guides are found in VETNet - https://vetnet.gov.au/Pages/TrainingDocs.aspx?q=1715b9fa-e7bd-441c-bb8d-cf22c9c825a8

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UEPMNT440 Diagnose and repair faults in power plant inverter systems

Modification History

Release 1. This is the first release of this unit of competency in the UEP Generation Training Package.

Application

This unit involves the skills and knowledge required to diagnose and repair faults in power generation plant inverter systems, including associated accessories, components and wiring systems.

The diagnosis and repair of inverter system faults requires the inspection, repair and verification to ensure that it is working efficiently and meeting operational requirements.

Competency in this unit requires the ability to plan work, verify fault, find fault, determine cause of fault, repair fault and complete all work tasks. Individuals will, in general, work under supervision in an electrical, electronic and/or mechanical equipment repair workshop or on site.

Power generation maintenance personnel are typically trained and authorised to receive permits to work.

No licensing, legislative or certification requirements apply to this unit at the time of publication.

Note: Workplace practice

The application of the skills and knowledge described in this unit of competency may require a licence or training permit to practice in the workplace, where work is carried out on gas and electrical installations. Additional and/or other conditions may apply under state and territory legislative and regulatory licensing requirements.

Pre-requisite Unit

UEPMNT366 Maintain power plant inverter systems

UEENEEG108A Troubleshoot and repair faults in low voltage electrical apparatus and circuits

UEENEEE102A Fabricate, assemble and dismantle utilities industry components

UEENEEE104A Solve problems in D.C. circuits

UEENEEE105A Fix and secure electrotechnology equipment

UEENEEE107A Use drawings, diagrams, schedules, standards, codes and specifications

UEENEEG006A Solve problems in single and three phase low voltage machines

UEENEEG033A Solve problems in single and three phase low voltage electrical apparatus and circuits

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UEENEEG063A Arrange circuits, control and protection for general electrical installations

UEENEEG101A Solve problems in electromagnetic devices and related circuits

UEENEEG102A Solve problems in low voltage A.C. circuits

UEENEEG106A Terminate cables, cords and accessories for low voltage circuits

Competency Field

Maintenance

Unit Sector

Electricity generation

Elements and Performance Criteria

ELEMENTS	PERFORMANCE CRITERIA
Elements describe the essential outcomes.	Performance criteria describe the performance needed to demonstrate achievement of the element.
1 Plan and prepare for work	**1.1** Requirements including scope of work and assigned roles are identified and confirmed with appropriate personnel or by site inspection, in accordance with workplace procedures
	1.2 Work, Health and Safety (WHS)/Occupational Health and Safety (OHS) regulations, legislative requirements, industry standards, codes of practice, manufacturers' specifications, environmental obligations and workplace procedures are reviewed in preparation for work
	1.3 Resources are obtained and inspected for compliance with job specifications
	1.4 Relevant plans, drawings and manuals are selected and used, in accordance with workplace procedures
	1.5 Correct quantity of materials and components for work are obtained and inspected for compliance with job specification
	1.6 Work is planned, sequenced and prioritised, in accordance with workplace procedures
	1.7 Potential hazards are identified and risk control

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		measures are selected and implemented, in accordance with workplace procedures
	1.8	Work area is prepared, in accordance with workplace procedures
2 Verify fault	**2.1**	Normal performance and function of inverter system equipment is ascertained by consulting appropriate personnel and reference sources, in accordance with workplace procedures
	2.2	Fault indicators, technical information and diagnostic techniques are used to verify reported faults, in accordance with workplace procedures
	2.3	Faults are reproduced and monitored, if possible, in accordance with workplace procedures
3 Find fault	**3.1**	Isolations are confirmed, where appropriate, in accordance with workplace procedures
	3.2	Equipment components, wires and terminations are inspected for faults, in accordance with workplace procedures
	3.3	Diagnostic techniques are selected and used, in accordance with workplace procedures
	3.4	Components are disconnected to enable accurate test measurements of suspected faulty components, without concern of back feed readings, in accordance with workplace procedures
	3.5	Test and measurement instruments are used, in accordance with workplace procedures and manufacturers' instructions
4 Determine cause of fault	**4.1**	Appropriate personnel are consulted to obtain details relating to faulty system, in accordance with workplace procedures
	4.2	Use is made of information from fault indicators and maintenance records, in accordance with workplace procedures
	4.3	Conclusions about nature and cause of fault are reached from analysis of available evidence, in accordance with workplace procedures

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5 Repair fault	**5.1**	Isolations are confirmed, where appropriate, in accordance with workplace procedures
	5.2	Faulty, worn or damaged components are replaced or repaired, in accordance with workplace procedures
	5.3	Parts and components are selected and used, in accordance with manufacturers' specifications and workplace procedures
	5.4	Inverter system components are disconnected for testing and are reconnected having been proven free of faults, and all terminations are then checked to ensure they are electrically and mechanically sound, in accordance with workplace procedures
	5.5	Faults are repaired, in accordance with workplace procedures
	5.6	Final inspection is performed, in accordance with workplace procedures
6 Complete work	**6.1**	Work is completed and appropriate personnel are notified, in accordance with workplace procedures
	6.2	Work area is cleared of waste, cleaned, restored and secured, in accordance with workplace procedures
	6.3	Tools and equipment are maintained and stored, in accordance with workplace procedures
	6.4	Work completion details are finalised, in accordance with workplace procedures

Foundation Skills

Foundation skills essential to performance are explicit in the performance criteria of this unit of competency.

Range of Conditions

Range is restricted to essential operating conditions and any other variables essential to the work environment.

Non-essential conditions may be found in the Companion Volume Implementation Guide.

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Unit Mapping Information

This unit replaces and is equivalent to UEPMNT440A Diagnose and repair faults in power plant inverter systems.

Links

Companion Volume implementation guides are found in VETNet - https://vetnet.gov.au/Pages/TrainingDocs.aspx?q=1715b9fa-e7bd-441c-bb8d-cf22c9c825a8

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Assessment Requirements for UEPMNT440 Diagnose and repair faults in power plant inverter systems

Modification History

Release 1. This is the first release of this unit of competency in the UEP Generation Training Package.

Performance Evidence

Evidence required to demonstrate competence in this unit must be relevant to and satisfy all the requirements of the elements, performance criteria and range of conditions on at least two separate occasions and includes:

- applying Work, Health and Safety (WHS)/Occupational Health and Safety (OHS) requirements including:
  - emergency procedures
  - hazard identification
  - risk control measures
  - safe working practices
- communicating with personnel
- completing work as per scheduled requirements
- determining cause of faults using data analysis techniques and tools
- determining permit to work requirements
- finding faults using diagnostic techniques and procedures
- implementing legislation, industry standards, codes of practice and regulations
- interpreting manufacturers' specifications and manuals
- planning and preparing for diagnosis and repair of faults in power plant inverter systems work
- repairing faults using repair techniques and procedures
- selecting materials
- using manufacturers' specifications and manuals
- utilising test and measurement instruments
- verifying faults using verification techniques

Knowledge Evidence

Evidence required to demonstrate competence in this unit must be relevant to and satisfy all the requirements of the elements, performance criteria and range of conditions and includes knowledge of:

- diagnostic techniques
- equipment and materials

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- generation plant and equipment, its location and operation
- isolations
- legislation, industry standards, codes of practice and regulations
- manufacturers' specifications and manuals
- permit to work system
- repair techniques
- test and measurement instruments
- typical arrangements of power production plant
- verification techniques
- WHS/OHS legislated requirements including:
  - emergency procedures
  - hazard identification
  - risk control measures
  - safe working practices
- workplace documentation
- workplace policies and procedures

Assessment Conditions

As a minimum, assessors must satisfy applicable regulatory requirements, which include requirements in the Standards for Registered Training Organisations current at the time of assessment.

As a minimum, assessment must satisfy applicable regulatory requirements, which include requirements in the Standards for Registered Training Organisations current at the time of assessment.

Assessment processes and techniques must be appropriate to the language, literacy and numeracy requirements of the work being performed and the needs of the candidate.

Assessment must occur in workplace operational situations. Where this is not appropriate, assessment must occur in simulated workplace operational situations that reflect workplace conditions.

Resources for assessment must include access to:

- a range of relevant exercises, case studies and/or other simulations
- relevant and appropriate materials, tools, equipment and personal protective equipment currently used in industry
- applicable documentation including workplace procedures, industry standards, equipment specifications, regulations, codes of practice and operation manuals.

Links

Companion Volume implementation guides are found in VETNet - https://vetnet.gov.au/Pages/TrainingDocs.aspx?q=1715b9fa-e7bd-441c-bb8d-cf22c9c825a8

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UEPMNT442 Maintain wind turbine generator electrical systems

Modification History

Release 1. This is the first release of this unit of competency in the UEP Generation Training Package.

Application

This unit involves the skills and knowledge required to undertake scheduled maintenance of electrical systems in large scale wind turbine generators.

Maintenance is the process of optimising power generation plant and equipment operations through regular inspections and verification of electrical systems in large scale wind turbine generators.

Competency in this unit requires the ability to plan work, conduct maintenance on wind turbine generator electrical systems and complete all work tasks. Individuals will, in general, work under supervision in an electrical, electronic and/or mechanical equipment repair workshop or on site.

Power generation maintenance personnel are typically trained and authorised to receive permits to work.

No licensing, legislative or certification requirements apply to this unit at the time of publication.

Note: Workplace practice

The application of the skills and knowledge described in this unit of competency may require a licence or training permit to practice in the workplace, where work is carried out on gas and electrical installations. Additional and/or other conditions may apply under state and territory legislative and regulatory licensing requirements.

Pre-requisite Unit

UEPMNT371 Maintain large scale wind turbine generators

UEENEEG006A Solve problems in single and three phase low voltage machines

UEENEEE102A Fabricate, assemble and dismantle electrotechnology components

UEENEEE104A Solve problems in D.C circuits

UEENEEE105A Fix and secure electrotechnology equipment

UEENEEE107A Use drawings, diagrams, schedules, standards, codes and specifications

UEENEEG101A Solve problems in electromagnetic devices and related circuits

UEENEEG102A Solve problems in low voltage A.C. circuit

UEENEEG106A Terminate cables, cords and accessories for low voltage circuits

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Competency Field

Maintenance

Unit Sector

Electricity generation

Elements and Performance Criteria

ELEMENTS	PERFORMANCE CRITERIA
Elements describe the essential outcomes.	Performance criteria describe the performance needed to demonstrate achievement of the element.
1 Plan and prepare for work	**1.1** Requirements including scope of work and assigned roles are identified and are confirmed with appropriate personnel or by site inspection, in accordance with workplace procedures
	1.2 Work, Health and Safety (WHS)/Occupational Health and Safety (OHS) regulations, legislative requirements, industry standards, codes of practice, manufacturers' specifications, environmental obligations and workplace procedures are reviewed in preparation for work
	1.3 Resources are obtained and inspected for compliance with job specification
	1.4 Relevant plans, drawings and manuals are selected and used, in accordance with workplace procedures
	1.5 Work is planned, sequenced and prioritised, in accordance with workplace procedures
	1.6 Work area is prepared, in accordance with workplace procedures
2 Conduct maintenance on wind turbine generator electrical systems	**2.1** Wind turbine generator equipment is replaced, if required, due to faulty operation or maintenance plan requirements, in accordance with workplace procedures and manufacturers' specifications
	2.2 Documented service checklists, or similar are followed, in accordance with workplace procedures
	2.3 Diagnostic testing and data from monitoring systems is used to identify those components requiring

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		maintenance
	2.4	Wind turbine generator equipment is dismantled, if required, for maintenance, in accordance with manufacturers' specifications and workplace procedures
	2.5	Techniques are used to enable identification or reassembly of wind turbine generator equipment, in accordance with workplace procedures
	2.6	New components are obtained, if required, and are inspected for compliance with manufacturers' specifications
	2.7	Wind turbine generator equipment is tested, monitored and adjusted, if required, in accordance with workplace procedures and manufacturers' specifications
3 Complete work	**3.1**	Work is completed and appropriate personnel are notified, in accordance with workplace requirements
	3.2	Work area is cleared of waste, cleaned, restored and secured, in accordance with workplace procedures
	3.3	Tools and equipment are maintained and stored, in accordance with workplace procedures
	3.4	Work completion details are finalised, in accordance with workplace procedures

Foundation Skills

Foundation skills essential to performance are explicit in the performance criteria of this unit of competency.

Range of Conditions

Range is restricted to essential operating conditions and any other variables essential to the work environment.

Non-essential conditions may be found in the Companion Volume Implementation Guide.

Unit Mapping Information

This unit replaces and is equivalent to UEPMNT442A Maintain wind turbine generator electrical systems.

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Links

Companion Volume implementation guides are found in VETNet - https://vetnet.gov.au/Pages/TrainingDocs.aspx?q=1715b9fa-e7bd-441c-bb8d-cf22c9c825a8

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Assessment Requirements for UEPMNT442 Maintain wind turbine generator electrical systems

Modification History

Release 1. This is the first release of this unit of competency in the UEP Generation Training Package.

Performance Evidence

Evidence required to demonstrate competence in this unit must be relevant to and satisfy all the requirements of the elements, performance criteria and range of conditions on at least two separate occasions and includes:

- applying Work, Health and Safety (WHS)/Occupational Health and Safety (OHS) requirements including:
  - emergency procedures
  - hazard identification
  - risk control measures
  - safe working practices
- communicating with personnel
- completing work as per scheduled requirements
- conducting maintenance on Wind Turbine Generator (WTG) electrical systems
- determining work to permit requirements
- identifying new components for use
- implementing legislation, industry standards, codes of practice and regulations
- measuring, inspecting and recording Wind Turbine Generator (WTG) electrical system
- performing isolations
- planning for wind turbine generator electrical system work
- reassembling and readjusting equipment and components in wind turbine generator electrical systems
- undertaking diagnostic testing
- using manufacturers' specifications and manuals

Knowledge Evidence

Evidence required to demonstrate competence in this unit must be relevant to and satisfy all the requirements of the elements, performance criteria and range of conditions and includes knowledge of:

- analysis and diagnostic methods and tools
- component identification and replacement
- isolations

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- legislation, industry standards, codes of practice and regulations
- maintenance of wind turbine generator electrical systems
- manufacturers' specifications and manuals
- measurement techniques
- permit to work system
- techniques for recognising wiring failure or potential for failure of wind turbine generator system and equipment
- test requirements of wind turbine generator electrical system
- WHS/OHS legislated requirements including:
  - emergency procedures
  - risk control measures
  - hazard identification
  - safe working practices
- wind turbine generator plant and its location at site
- wind turbine generator system types and characteristics
- workplace documentation
- workplace policies and procedures

Assessment Conditions

As a minimum, assessors must satisfy applicable regulatory requirements, which include requirements in the Standards for Registered Training Organisations current at the time of assessment.

As a minimum, assessment must satisfy applicable regulatory requirements, which include requirements in the Standards for Registered Training Organisations current at the time of assessment.

Assessment processes and techniques must be appropriate to the language, literacy and numeracy requirements of the work being performed and the needs of the candidate.

Assessment must occur in workplace operational situations. Where this is not appropriate, assessment must occur in simulated workplace operational situations that reflect workplace conditions.

Resources for assessment must include access to:

- a range of relevant exercises, case studies and/or other simulations
- relevant and appropriate materials, tools, equipment and personal protective equipment currently used in industry
- applicable documentation including workplace procedures, industry standards, equipment specifications, regulations, codes of practice and operation manuals.

Links

Companion Volume implementation guides are found in VETNet - https://vetnet.gov.au/Pages/TrainingDocs.aspx?q=1715b9fa-e7bd-441c-bb8d-cf22c9c825a8

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UEPMNT443 Maintain wind turbine generator control systems

Modification History

Release 1. This is the first release of this unit of competency in the UEP Generation Training Package.

Application

This unit involves the skills and knowledge required to undertake scheduled maintenance of control systems in large scale wind turbine generators.

Maintenance is the process of optimising control system operations in large scale wind turbine generators through regular inspections and verification of operational efficiency.

Competency in this unit requires the ability to plan work, conduct maintenance on wind turbine generator electrical systems and complete all work tasks. Individuals will, in general, work under supervision in an electrical, electronic and/or mechanical equipment repair workshop or on site.

Power generation maintenance personnel are typically trained and authorised to receive permits to work.

No licensing, legislative or certification requirements apply to this unit at the time of publication.

Note: Workplace practice

The application of the skills and knowledge described in this unit of competency may require a licence or training permit to practice in the workplace, where work is carried out on gas and electrical installations. Additional and/or other conditions may apply under state and territory legislative and regulatory licensing requirements.

Pre-requisite Unit

UEPMNT371 Maintain large scale wind turbine generators

Competency Field

Maintenance

Unit Sector

Electricity generation

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Elements and Performance Criteria

ELEMENTS	PERFORMANCE CRITERIA
Elements describe the essential outcomes.	Performance criteria describe the performance needed to demonstrate achievement of the element.
1 Plan and prepare for work	**1.1** Requirements including scope of work and assigned roles are identified and confirmed with appropriate personnel or by site inspection, in accordance with workplace procedures
	1.2 Work, Health and Safety (WHS)/Occupational Health and Safety (OHS) regulations, legislative requirements, industry standards, codes of practice, manufacturers' specifications, environmental obligations and workplace procedures are reviewed in preparation for work
	1.3 Resources are obtained and inspected for compliance with job specification
	1.4 Relevant plans, drawings and manuals are selected and used, in accordance with workplace procedures
	1.5 Work is planned, sequenced and prioritised, in accordance with workplace procedures
	1.6 Isolations are requested, if required, in accordance with workplace procedures
	1.7 Work area is prepared, in accordance with workplace procedures
2 Conduct maintenance on wind generator turbine control systems	**2.1** Faulty control system equipment is replaced, in accordance with manufacturers' specifications and workplace procedures
	2.2 Documented service checklists, or similar, are followed, in accordance with workplace procedures
	2.3 Diagnostic testing and data from monitoring systems are used to identify those components requiring maintenance
	2.4 Control system equipment is dismantled for maintenance, if required, in accordance with manufacturers' specifications and workplace procedures
	2.5 Approved maintenance techniques are used to enable identification or reassembly of components, in

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		accordance with workplace procedures
	2.6	New components are obtained and inspected for compliance with manufacturers' specifications, in accordance with workplace procedures
	2.7	Control system equipment is tested, monitored and adjusted, as required, in accordance with manufacturers' specifications and workplace procedures
3 Complete work	**3.1**	Work is completed and appropriate personnel are notified, in accordance with workplace procedures
	3.2	Work area is cleared of waste, cleaned, restored and secured, in accordance with workplace procedures
	3.3	Tools and equipment are maintained and stored, in accordance with workplace procedures
	3.4	Work completion details are finalised, in accordance with workplace procedures

Foundation Skills

Foundation skills essential to performance are explicit in the performance criteria of this unit of competency.

Range of Conditions

Range is restricted to essential operating conditions and any other variables essential to the work environment.

Non-essential conditions may be found in the Companion Volume Implementation Guide.

Unit Mapping Information

This unit replaces and is equivalent to UEPMNT443A Maintain wind turbine generator control systems.

Links

Companion Volume implementation guides are found in VETNet - https://vetnet.gov.au/Pages/TrainingDocs.aspx?q=1715b9fa-e7bd-441c-bb8d-cf22c9c825a8

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Assessment Requirements for UEPMNT443 Maintain wind turbine generator control systems

Modification History

Release 1. This is the first release of this unit of competency in the UEP Generation Training Package.

Performance Evidence

Evidence required to demonstrate competence in this unit must be relevant to and satisfy all the requirements of the elements, performance criteria and range of conditions on at least two separate occasions and includes:

- applying Work, Health and Safety (WHS)/Occupational Health and Safety (OHS) requirements including:
  - emergency procedures
  - hazard identification
  - risk control measures
  - safe working practices
- communicating with personnel
- completing work as per scheduled requirements
- conducting maintenance on wind turbine generator control systems
- determining permit to work requirements
- diagnosing wind turbine generator control system faults including interpreting fault codes and data
- legislation, industry standards, codes of practice and regulations
- manufacturers' specifications and manuals
- planning for maintenance of wind turbine generator control systems work
- reassembling wind turbine generator control system equipment and/or components
- replacing wind turbine generator control system equipment and/or components
- testing wind turbine generator control system and equipment
- undertaking maintenance on wind turbine generator control systems

Knowledge Evidence

Evidence required to demonstrate competence in this unit must be relevant to and satisfy all the requirements of the elements, performance criteria and range of conditions and includes knowledge of:

- diagnosis techniques for wind turbine generator control system faults including codes
- legislation, industry standards, codes of practice and regulations
- maintenance requirements for wind turbine generator control systems

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- manufacturers' specifications and manuals
- permit to work system
- reassembly techniques for wind turbine generator control system equipment and/or components
- replacement techniques for wind turbine generator control system equipment and/or components
- tests for wind turbine generator control system and equipment
- WHS/OHS legislated requirements including:
  - emergency procedures
  - hazard identification
  - risk control measures
  - safe working practices
- wind turbine generation control system, types and characteristics
- workplace documentation
- workplace policies and procedures

Assessment Conditions

As a minimum, assessors must satisfy applicable regulatory requirements, which include requirements in the Standards for Registered Training Organisations current at the time of assessment.

As a minimum, assessment must satisfy applicable regulatory requirements, which include requirements in the Standards for Registered Training Organisations current at the time of assessment.

Assessment processes and techniques must be appropriate to the language, literacy and numeracy requirements of the work being performed and the needs of the candidate.

Assessment must occur in workplace operational situations. Where this is not appropriate, assessment must occur in simulated workplace operational situations that reflect workplace conditions.

Resources for assessment must include access to:

- a range of relevant exercises, case studies and/or other simulations
- relevant and appropriate materials, tools, equipment and personal protective equipment currently used in industry
- applicable documentation including workplace procedures, industry standards, equipment specifications, regulations, codes of practice and operation manuals.

Links

Companion Volume implementation guides are found in VETNet - https://vetnet.gov.au/Pages/TrainingDocs.aspx?q=1715b9fa-e7bd-441c-bb8d-cf22c9c825a8

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UEPMNT444 Maintain wind turbine generator mechanical systems

Modification History

Release 1. This is the first release of this unit of competency in the UEP Generation Training Package.

Application

This unit involves the skills and knowledge required to undertake maintenance of wind turbine generator mechanical systems.

Undertaking maintenance is the process of optimising power generation plant and equipment operations through regular inspections and verification of wind turbine generator mechanical system operational efficiency.

Competency in this unit requires the ability to plan work, conduct maintenance on wind turbine generator mechanical systems and complete all work tasks. Individuals will, in general, work under supervision in an electrical, electronic and/or mechanical equipment repair workshop or on site.

Power generation maintenance personnel are typically trained and authorised to receive permits to work.

No licensing, legislative or certification requirements apply to this unit at the time of publication.

Note: Workplace practice

The application of the skills and knowledge described in this unit of competency may require a licence or training permit to practice in the workplace, where work is carried out on gas and electrical installations. Additional and/or other conditions may apply under state and territory legislative and regulatory licensing requirements.

Pre-requisite Unit

UEPMNT371 Maintain large scale wind turbine generators

Competency Field

Maintenance

Unit Sector

Electricity generation

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Elements and Performance Criteria

ELEMENTS	PERFORMANCE CRITERIA
Elements describe the essential outcomes.	Performance criteria describe the performance needed to demonstrate achievement of the element.
1 Plan and prepare for work	**1.1** Requirements including scope of work and assigned roles are identified and confirmed with appropriate personnel or by site inspection, in accordance with workplace procedures
	1.2 Work, Health and Safety (WHS)/Occupational Health and Safety (OHS) regulations, legislative requirements, industry standards, codes of practice, manufacturers' specifications, environmental obligations and workplace procedures are reviewed in preparation for work
	1.3 Resources are obtained and inspected for compliance with job specification
	1.4 Relevant plans, drawings and manuals are selected and used, in accordance with workplace procedures
	1.5 Work is planned, sequenced and prioritised, in accordance with workplace procedures
	1.6 Work area is prepared, in accordance with work requirements and site procedures
2 Conduct maintenance on wind turbine generator mechanical systems	**2.1** Faulty wind turbine generator mechanical system equipment is replaced, in accordance with manufacturers' specifications and workplace procedures
	2.2 Documented service checklists, or similar, are followed, in accordance with workplace procedures
	2.3 Diagnostic testing and data from monitoring systems is used to identify components requiring maintenance
	2.4 Wind turbine generator mechanical system equipment is dismantled for maintenance, in accordance with manufacturers' specifications and workplace procedures
	2.5 Maintenance techniques are used to enable identification or reassembly of components, in accordance with workplace procedures
	2.6 New components are obtained and inspected for

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		compliance with manufacturers' specifications
	2.7	Turbine generator mechanical system equipment is tested, monitored and adjusted, as required, in accordance with manufacturers' specifications and workplace procedures
3 Complete work	**3.1**	Work is completed and appropriate personnel are notified, in accordance with workplace procedures
	3.2	Work area is cleared of waste, cleaned, restored and secured, in accordance with workplace procedures
	3.3	Tools and equipment are maintained and stored, in accordance with workplace procedures
	3.4	Work completion details are finalised, in accordance with workplace procedures

Foundation Skills

Foundation skills essential to performance are explicit in the performance criteria of this unit of competency.

Range of Conditions

Range is restricted to essential operating conditions and any other variables essential to the work environment.

Non-essential conditions may be found in the Companion Volume Implementation Guide.

Unit Mapping Information

This unit replaces and is equivalent to UEPMNT444A Maintain wind turbine generator mechanical systems.

Links

Companion Volume implementation guides are found in VETNet - https://vetnet.gov.au/Pages/TrainingDocs.aspx?q=1715b9fa-e7bd-441c-bb8d-cf22c9c825a8

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Assessment Requirements for UEPMNT444 Maintain wind turbine generator mechanical systems

Modification History

Release 1. This is the first release of this unit of competency in the UEP Generation Training Package.

Performance Evidence

Evidence required to demonstrate competence in this unit must be relevant to and satisfy all the requirements of the elements, performance criteria and range of conditions on at least two separate occasions and includes:

- applying Work, Health and Safety (WHS)/Occupational Health and Safety (OHS) requirements including:
  - emergency procedures
  - hazard identification
  - risk control measures
  - safe working practices
- communicating with personnel
- completing work as per scheduled requirements
- conducting maintenance on wind turbine generator mechanical systems
- determining permit to work requirements
- diagnosing wind turbine generator mechanical system faults including interpreting fault data
- implementing legislation, industry standards, codes of practice and regulations
- interpreting manufacturers' specifications and manuals
- planning for wind turbine generator mechanical system work
- reassembling wind turbine generator mechanical system equipment and/or components
- replacing wind turbine generator mechanical system equipment and/or components
- testing wind turbine generator mechanical system and equipment

Knowledge Evidence

Evidence required to demonstrate competence in this unit must be relevant to and satisfy all the requirements of the elements, performance criteria and range of conditions and includes knowledge of:

- diagnosis techniques for wind turbine generator mechanical system faults
- legislation, industry standards, codes of practice and regulations
- maintenance requirements for wind turbine generator mechanical systems
- manufacturers' specifications and manuals

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- permit to work system
- reassembly techniques for wind turbine generator mechanical system equipment and/or components
- replacement techniques for wind turbine generator mechanical system equipment and/or components
- tests for wind turbine generator mechanical system and equipment
- WHS/OHS legislated requirements including:
  - emergency procedures
  - hazard identification
  - risk control measures
  - safe working practices
- wind turbine generation mechanical system, types and characteristics
- workplace documentation
- workplace policies and procedures

Assessment Conditions

As a minimum, assessors must satisfy applicable regulatory requirements, which include requirements in the Standards for Registered Training Organisations current at the time of assessment.

As a minimum, assessment must satisfy applicable regulatory requirements, which include requirements in the Standards for Registered Training Organisations current at the time of assessment.

Assessment processes and techniques must be appropriate to the language, literacy and numeracy requirements of the work being performed and the needs of the candidate.

Assessment must occur in workplace operational situations. Where this is not appropriate, assessment must occur in simulated workplace operational situations that reflect workplace conditions.

Resources for assessment must include access to:

- a range of relevant exercises, case studies and/or other simulations
- relevant and appropriate materials, tools, equipment and personal protective equipment currently used in industry
- applicable documentation including workplace procedures, industry standards, equipment specifications, regulations, codes of practice and operation manuals.

Links

Companion Volume implementation guides are found in VETNet - https://vetnet.gov.au/Pages/TrainingDocs.aspx?q=1715b9fa-e7bd-441c-bb8d-cf22c9c825a8

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UEPMNT445 Diagnose and repair faults in large scale wind turbine generators

Modification History

Release 1. This is the first release of this unit of competency in the UEP Generation Training Package.

Application

This unit involves the skills and knowledge required to diagnose and repair faults in large scale wind turbine generator systems.

Diagnosing and repairing faults is the process of inspecting wind turbine generator systems to identify problems and ensure repairs take place. The aim is to enhance the overall delivery of large scale wind turbine generator systems.

Competency in this unit requires the ability to gather data, interpret data to establish a theory about fault, repair faults and record faults. Individuals will, in general, work under supervision in an electrical, electronic and/or mechanical equipment repair workshop or on site.

Power generation maintenance personnel are typically trained and authorised to receive permits to work.

No licensing, legislative or certification requirements apply to this unit at the time of publication.

Note: Workplace practice

The application of the skills and knowledge described in this unit of competency may require a licence or training permit to practice in the workplace, where work is carried out on gas and electrical installations. Additional and/or other conditions may apply under state and territory legislative and regulatory licensing requirements.

Pre-requisite Unit

UEPMNT371 Maintain large scale wind turbines generators

UEENEEG108A Troubleshoot and repair faults in low voltage electrical apparatus and circuits

UEENEEE102A Fabricate, assemble and dismantle utilities industry components

UEENEEE104A Solve problems in D.C. circuits

UEENEEE105A Fix and secure electrotechnology equipment

UEENEEE107A Use drawings, diagrams, schedules, standards, codes and specifications

UEENEEG006A Solve problems in single and three phase low voltage machines

UEENEEG033A Solve problems in single and three phase low voltage electrical apparatus and circuits

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UEENEEG063A Arrange circuits, control and protection for general electrical installations

UEENEEG101A Solve problems in electromagnetic devices and related circuits

UEENEEG102A Solve problems in low voltage A.C. circuits

UEENEEG106A Terminate cables, cords and accessories for low voltage circuits

Competency Field

Maintenance

Unit Sector

Electricity generation

Elements and Performance Criteria

ELEMENTS	PERFORMANCE CRITERIA
Elements describe the essential outcomes.	Performance criteria describe the performance needed to demonstrate achievement of the element.
1 Gather data	**1.1** Wind turbine generator system's data logging information and error codes are accessed, in accordance with workplace procedures
	1.2 Wind turbine generator system's sensory data on fault is gathered
	1.3 Hard copy or online documentation is accessed to support fault finding process, in accordance with workplace procedures
	1.4 Fault indicators and error codes are examined and interpreted, in accordance with workplace procedures
	1.5 Circuit diagrams, manufacturers' specifications, schematics and/or consultation with technical advisors are used to determine circuit and system characteristics and function
2 Interpret data to establish hypothesis about fault	**2.1** Wind turbine generator system performance parameters are identified and applied to interpretation of fault data
	2.2 Wind turbine generator system faults are verified, or localised, using approved techniques, procedures, tools and test equipment

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	2.3	Priorities are set for testing or replacement of specific components, wiring and connections in wind turbine generator systems
3 Repair fault	**3.1**	Risk analysis is undertaken, in accordance with workplace procedures, and is communicated to the work team
	3.2	Safety precautions including circuit isolations, physical barriers and other protective devices or systems are used, where appropriate
	3.3	Tests are conducted to ensure fault has been correctly repaired or isolated, in accordance with workplace procedures
	3.4	Wind turbine generator system faulty components that have been removed from service are examined and cause of problem is identified
	3.5	Loose connections or wiring in the wind turbine generator system are repaired, in accordance with workplace procedures
	3.6	Parts or components are removed and replaced with tested and operational parts
	3.7	Wind turbine generator system is tested, in accordance with workplace procedures, to ensure correct operation
	3.8	Fault finding process is escalated to repairing a complex fault using a technical adviser, if required
4 Record fault	**4.1**	Wind turbine generator system's faulty components and parts are correctly tagged, identified and stored, in accordance with workplace procedures
	4.2	Wind turbine generator system's faults are recorded, in accordance with workplace procedures

Foundation Skills

Foundation skills essential to performance are explicit in the performance criteria of this unit of competency.

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Range of Conditions

Range is restricted to essential operating conditions and any other variables essential to the work environment.

Non-essential conditions may be found in the Companion Volume Implementation Guide.

Unit Mapping Information

This unit replaces and is equivalent to UEPMNT445A Diagnose and repair faults in large scale wind turbine generators.

Links

Companion Volume implementation guides are found in VETNet - https://vetnet.gov.au/Pages/TrainingDocs.aspx?q=1715b9fa-e7bd-441c-bb8d-cf22c9c825a8

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Assessment Requirements for UEPMNT445 Diagnose and repair faults in large scale wind turbine generators

Modification History

Release 1. This is the first release of this unit of competency in the UEP Generation Training Package.

Performance Evidence

Evidence required to demonstrate competence in this unit must be relevant to and satisfy all the requirements of the elements, performance criteria and range of conditions on at least two separate occasions and includes:

- applying Work, Health and Safety (WHS)/Occupational Health and Safety (OHS) requirements including:
  - emergency procedures
  - hazard identification
  - risk control measures
  - safe working practices
- communicating with personnel
- determining permit to work requirements
- diagnosing wind turbine generator system faults
- gathering wind turbine generator system data
- implementing legislation, industry standards, codes of practice and regulations
- interpreting data logs and equipment error code to determine of fault
- interpreting wind turbine generator system data to establish theory about faults
- reassembling wind turbine generator system
- recording faults
- repairing wind turbine generator system faults
- replacing faulty equipment
- replacing wind turbine generator system equipment and/or components
- testing wind turbine generator system systems including pitch system, yaw system, gearbox, generator, control systems, braking and start up systems and weather monitoring systems
- using manufacturers' specifications and manuals

Knowledge Evidence

Evidence required to demonstrate competence in this unit must be relevant to and satisfy all the requirements of the elements, performance criteria and range of conditions and includes knowledge of:

- data logs and system

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- diagnosis techniques for wind turbine generator system faults
- error codes
- legislation, industry standards, codes of practice and regulations
- manufacturers' specifications and manuals
- permit to work system
- reassembly techniques for wind turbine generator system equipment and/or components
- replacement techniques for wind turbine generator system equipment and/or components
- tests for wind turbine generator systems and equipment
- types and characteristics of wind turbine generator systems
- WHS/OHS legislated requirements including:
  - emergency procedures
  - risk control measures
  - hazard identification
  - safe working practices
- wind turbine generator design and control system
- wind turbine generator system testing and function
- workplace documentation
- workplace policies and procedures

Assessment Conditions

As a minimum, assessors must satisfy applicable regulatory requirements, which include requirements in the Standards for Registered Training Organisations current at the time of assessment.

As a minimum, assessment must satisfy applicable regulatory requirements, which include requirements in the Standards for Registered Training Organisations current at the time of assessment.

Assessment processes and techniques must be appropriate to the language, literacy and numeracy requirements of the work being performed and the needs of the candidate.

Assessment must occur in workplace operational situations. Where this is not appropriate, assessment must occur in simulated workplace operational situations that reflect workplace conditions.

Resources for assessment must include access to:

- a range of relevant exercises, case studies and/or other simulations
- relevant and appropriate materials, tools, equipment and personal protective equipment currently used in industry
- applicable documentation including workplace procedures, industry standards, equipment specifications, regulations, codes of practice and operation manuals.

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UEPMNT446 Coordinate maintenance on a wind farm

Modification History

Release 1. This is the first release of this unit of competency in the UEP Generation Training Package.

Application

This unit involves the skills and knowledge required to coordinate scheduled servicing and maintenance of wind turbine generators on a wind farm.

Scheduled maintenance is the process of optimising plant and equipment operations through regular inspections and verification of wind turbine generators for operational efficiency.

Competency in this unit requires the ability to plan for scheduled maintenance, coordinate scheduled maintenance, respond to wind turbine generator breakdown, produce production and maintenance reports and make recommendations for dealing with wind turbine generator breakdowns. Individuals will, in general, work as a coordinator in an electrical, electronic and/or mechanical equipment repair workshop or on site.

Power generation maintenance personnel are typically trained and authorised to receive permits to work.

No licensing, legislative or certification requirements apply to this unit at the time of publication.

Note: Workplace practice

The application of the skills and knowledge described in this unit of competency may require a licence or training permit to practice in the workplace, where work is carried out on gas and electrical installations. Additional and/or other conditions may apply under state and territory legislative and regulatory licensing requirements.

Pre-requisite Unit

UEPMNT445 Diagnose and repair faults in large scale wind turbine generators

UEPMNT448 Diagnose and repair faults in large scale wind turbine generator control systems

UEPMNT449 Diagnose and repair mechanical systems faults in large scale wind turbine generators mechanical systems

UEPMNT371 Maintain large scale wind turbines generators

UEENEEG108A Troubleshoot and repair faults in low voltage electrical apparatus and circuits

UEENEEE102A Fabricate, assemble and dismantle utilities industry components

UEENEEE104A Solve problems in D.C. circuits

UEENEEE105A Fix and secure electrotechnology equipment

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UEENEEG107A Use drawings, diagrams, schedules, standards, codes and specifications

UEENEEG006A Solve problems in single and three phase low voltage machines

UEENEEG033A Solve problems in single and three phase low voltage electrical apparatus and circuits

UEENEEG063A Arrange circuits, control and protection for general electrical installations

UEENEEG101A Solve problems in electromagnetic devices and related circuits

UEENEEG102A Solve problems in low voltage A.C. circuits

UEENEEG106A Terminate cables, cords and accessories for low voltage circuits

UEPMNT443 Maintain wind turbine generator control systems

UEENEEE107A Use drawings, diagrams, schedules, standards, codes and specifications

UEPMNT444 Maintain wind turbine generator mechanical systems

Competency Field

Maintenance

Unit Sector

Electricity generation

Elements and Performance Criteria

ELEMENTS	PERFORMANCE CRITERIA
Elements describe the essential outcomes.	Performance criteria describe the performance needed to demonstrate achievement of the element.
1 Plan for scheduled maintenance	**1.1** Maintenance schedules provided by key stakeholders and organisational representatives are accessed and interpreted
	1.2 Local maintenance work schedules are developed, in accordance with workplace procedures
	1.3 Stock and spare parts are identified, in accordance with workplace procedures
2 Coordinate scheduled maintenance	**2.1** Roles and tasks are allocated to onsite personnel, in accordance with workplace procedures
	2.2 Scheduled maintenance is performed, in accordance with workplace procedures and within established

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		timeframes
	2.3	A financial budget for scheduled maintenance is identified and coordinated
	2.4	Maintenance tasks are completed as per the maintenance schedule and industry standards
	2.5	Allocation of work tasks is coordinated, in accordance with workplace procedures
	2.6	Risk control measures are identified, prioritised and evaluated against maintenance schedule
	2.7	Work permits are secured for performance of maintenance tasks, in accordance with workplace procedures
3 Respond to wind turbine generator breakdown	**3.1**	An action plan for wind turbine generator breakdowns is developed and implemented, in accordance with workplace procedures
	3.2	Key stakeholders, personnel and organisations are advised of outage, in accordance with workplace procedures
	3.3	Out of hours' breakdown roster is updated and applied, in accordance with workplace procedures
	3.4	Analysis of wind turbine generator breakdown to determine likely remediation actions is undertaken, in accordance with workplace procedures
	3.5	Resources to find cause of wind turbine generator fault or breakdown are allocated
	3.6	Escalation procedures are applied, if required, for wind turbine generator fault
	3.7	Remediation for defective components or plant is selected, in accordance with workplace procedures
	3.8	Technical advice is given regarding potential hazards, safety risks and risk control measures or appropriate authorities are consulted
	3.9	Solutions to non-routine problems are identified and actioned, in accordance with workplace procedures

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4 Produce production and maintenance reports	**4.1** Wind turbine generator records to produce maintenance reports are accessed
	4.2 Reports are produced, in accordance with workplace procedures and standards using applicable software and formats
	4.3 Reports are distributed to stakeholders and appropriate personnel, in accordance with workplace procedures
5 Make recommendations for dealing with wind turbine generator breakdowns	**5.1** Recommendations for dealing with wind turbine generator breakdowns are made to appropriate personnel
	5.2 Debriefing discussion is held with team members to facilitate managing similar wind turbine generator breakdowns

Foundation Skills

Foundation skills essential to performance are explicit in the performance criteria of this unit of competency.

Range of Conditions

Range is restricted to essential operating conditions and any other variables essential to the work environment.

Non-essential conditions may be found in the Companion Volume Implementation Guide.

Unit Mapping Information

This unit replaces and is equivalent to UEPMNT446A Coordinate maintenance on a wind farm.

Links

Companion Volume implementation guides are found in VETNet - https://vetnet.gov.au/Pages/TrainingDocs.aspx?q=1715b9fa-e7bd-441c-bb8d-cf22c9c825a8

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Assessment Requirements for UEPMNT446 Coordinate maintenance on a wind farm

Modification History

Release 1. This is the first release of this unit of competency in the UEP Generation Training Package.

Performance Evidence

Evidence required to demonstrate competence in this unit must be relevant to and satisfy all the requirements of the elements, performance criteria and range of conditions on at least two separate occasions and includes:

- applying Work, Health and Safety (WHS)/Occupational Health and Safety (OHS) requirements including:
  - emergency procedures
  - hazard identification
  - risk control measures
  - safe working practices
- communicating with personnel and stakeholders
- coordinating scheduled maintenance
- determining permit to work requirements
- developing maintenance schedule plan
- implementing legislation, industry standards, codes of practice and regulations
- making recommendations for dealing with wind turbine generator breakdowns
- planning for scheduled maintenance work
- producing maintenance reports
- producing maintenance reports
- providing direction to team members involved in maintenance activities
- responding to wind turbine generator breakdown
- using manufacturers' specifications and manuals
- utilising risk control register

Knowledge Evidence

Evidence required to demonstrate competence in this unit must be relevant to and satisfy all the requirements of the elements, performance criteria and range of conditions and includes knowledge of:

- communication in a team environment
- coordination responsibilities

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- development of team members through task allocation
- equipment spares and consumables suitable for maintenance
- escalations for identified faults
- legislation, industry standards, codes of practice and regulations
- manufacturers' specifications and manuals
- organising maintenance schedules and plans
- permit to work system
- report writing including standards and styles
- WHS/OHS legislated requirements including:
  - emergency procedures
  - hazard identification
  - risk control measures
  - safe working practices
- workplace documentation
- workplace policies and procedures

Assessment Conditions

As a minimum, assessors must satisfy applicable regulatory requirements, which include requirements in the Standards for Registered Training Organisations current at the time of assessment.

As a minimum, assessment must satisfy applicable regulatory requirements, which include requirements in the Standards for Registered Training Organisations current at the time of assessment.

Assessment processes and techniques must be appropriate to the language, literacy and numeracy requirements of the work being performed and the needs of the candidate.

Assessment must occur in workplace operational situations. Where this is not appropriate, assessment must occur in simulated workplace operational situations that reflect workplace conditions.

Resources for assessment must include access to:

- a range of relevant exercises, case studies and/or other simulations
- relevant and appropriate materials, tools, equipment and personal protective equipment currently used in industry
- applicable documentation including workplace procedures, industry standards, equipment specifications, regulations, codes of practice and operation manuals.

Links

Companion Volume implementation guides are found in VETNet - https://vetnet.gov.au/Pages/TrainingDocs.aspx?q=1715b9fa-e7bd-441c-bb8d-cf22c9c825a8

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UEPMNT447 Diagnose and repair faults in wind turbine generator electrical systems

Modification History

Release 1. This is the first release of this unit of competency in the UEP Generation Training Package.

Application

This unit involves the skills and knowledge required to diagnose and repair faults in large scale wind turbine generator electrical systems.

Diagnosis and repair of faults is the process of optimising large scale wind turbine generator electrical system outcomes through regular inspection and verification of operational efficiency.

Competency in this unit requires the ability to gather data, interpret data to establish hypothesis about wind turbine generator electrical system fault, repair wind turbine generator electrical system fault and record wind turbine generator electrical system fault. Individuals will, in general, work under supervision in an electrical, electronic and/or mechanical equipment repair workshop or on site.

Power generation maintenance personnel are typically trained and authorised to receive permits to work.

No licensing, legislative or certification requirements apply to this unit at the time of publication.

Note: Workplace practice

The application of the skills and knowledge described in this unit of competency may require a licence or training permit to practice in the workplace, where work is carried out on gas and electrical installations. Additional and/or other conditions may apply under state and territory legislative and regulatory licensing requirements.

Pre-requisite Unit

UEPMNT371 Maintain large scale wind turbine generators

UEPMNT442 Maintain wind turbine generator electrical systems

UEPMNT445 Diagnose and repair faults in large scale wind turbine generators

UEENEEE102A Fabricate, assemble and dismantle electrotechnology components

UEENEEE104A Solve problems in D.C circuits

UEENEEE105A Fix and secure electrotechnology equipment

UEENEEE107A Use drawings, diagrams, schedules, standards, codes and specifications

UEENEEG006A Solve problems in single and three phase low voltage machines

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UEENEEG033A Solve problems in single and three phase low voltage electrical apparatus and circuits

UEENEEG063A Arrange circuits, control and protection for general electrical installations

UEENEEG101A Solve problems in electromagnetic devices and related circuits

UEENEEG102A Solve problems in low voltage A.C. circuits

UEENEEG106A Terminate cables, cords and accessories for low voltage circuits

UEENEEG108A Troubleshoot and repair faults in low voltage electrical apparatus and circuits

Competency Field

Maintenance

Unit Sector

Electricity generation

Elements and Performance Criteria

ELEMENTS	PERFORMANCE CRITERIA
Elements describe the essential outcomes.	Performance criteria describe the performance needed to demonstrate achievement of the element.
1 Gather data	**1.1** Data logging information and error codes are accessed, in accordance with workplace procedures
	1.2 Sensory data on fault is gathered, in accordance with workplace procedures
	1.3 Documentation is accessed, in accordance with workplace procedures, to support fault finding process
	1.4 Built in fault indicators and error codes are, where appropriate, examined and interpreted
	1.5 Reference to circuit diagrams, manufacturers' specifications, schematics or consultation with technical adviser is used to determine electrical circuit or system functions and characteristics
2 Interpret data to establish hypothesis about wind turbine generator electrical system fault	**2.1** Knowledge of wind turbine generator electrical systems and performance parameters is applied to interpretation of fault data

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	2.2	Wind turbine generator electrical system faults are verified or localised using appropriate techniques, tools and test equipment, in accordance with workplace procedures.
	2.3	Priorities are set for testing or replacement of specific components, wiring and connections in the wind turbine generator electrical system
3 Repair wind turbine generator electrical system fault	**3.1**	Risk analysis is undertaken and is communicated to work team and appropriate personnel, in accordance with workplace procedures
	3.2	Safety precautions including circuit isolations, physical barriers and other protective devices or systems are, where appropriate, used in accordance with workplace procedures
	3.3	Tests are conducted to ensure wind turbine generator electrical system fault has been isolated
	3.4	Faulty components are removed from service and are examined to identify the cause of the problem
	3.5	Loose connections or wiring are repaired, in accordance with workplace procedures
	3.6	Faulty parts of wind turbine generator electrical system are removed and replaced with tested and operational parts
	3.7	Wind turbine generator electrical system is tested, in accordance with workplace procedures, to ensure correct operation
	3.8	Repairs to complex faults are, if required, escalated, in accordance with workplace procedures, to a technical adviser
4 Record wind turbine generator electrical system fault	**4.1**	Wind turbine generator electrical system faulty components and parts are tagged, identified and stored, in accordance with workplace procedures
	4.2	Faults are recorded, in accordance with workplace procedures

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Foundation Skills

Foundation skills essential to performance are explicit in the performance criteria of this unit of competency.

Range of Conditions

Range is restricted to essential operating conditions and any other variables essential to the work environment.

Non-essential conditions may be found in the Companion Volume Implementation Guide.

Unit Mapping Information

This unit replaces and is equivalent to UEPMNT447A Diagnose and repair faults in wind turbine generator electrical systems.

Links

Companion Volume implementation guides are found in VETNet - https://vetnet.gov.au/Pages/TrainingDocs.aspx?q=1715b9fa-e7bd-441c-bb8d-cf22c9c825a8

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Assessment Requirements for UEPMNT447 Diagnose and repair faults in wind turbine generator electrical systems

Modification History

Release 1. This is the first release of this unit of competency in the UEP Generation Training Package.

Performance Evidence

Evidence required to demonstrate competence in this unit must be relevant to and satisfy all the requirements of the elements, performance criteria and range of conditions on at least two separate occasions and includes:

- applying Work, Health and Safety (WHS)/Occupational Health and Safety (OHS) requirements including:
  - emergency procedures
  - hazard identification
  - risk control measures
  - safe working practices
- communicating with personnel
- determining permit to work requirements
- gathering data including faulty indicators, error codes and sensory data
- implementing legislation, industry standards, codes of practice and regulations
- interpreting data to establish theory about wind turbine generator electrical system faults
- recording wind turbine generator electrical system faults
- removing and repairing wind turbine generator electrical system faults
- tagging and storing faulty wind turbine generator electrical system parts
- testing wind turbine generator electrical system
- undertaking risk analysis
- using manufacturers' specifications and manuals
- utilising safety precautions
- verifying faults

Knowledge Evidence

Evidence required to demonstrate competence in this unit must be relevant to and satisfy all the requirements of the elements, performance criteria and range of conditions and includes knowledge of:

- fault diagnosis and verification
- installation and/or repair of wind turbine generator electrical system

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- isolations
- legislation, industry standards, codes of practice and regulations
- manufacturers' specifications and manuals
- permit to work system
- risk analysis
- safety precautions
- tag and storage of faulty wind turbine generator electrical system parts
- techniques for replacing damaged wiring
- WHS/OHS legislated requirements including:
  - emergency procedures
  - risk control measures
  - hazard identification
  - safe working practices
- wind turbine generator electrical system testing
- workplace documentation
- workplace policies and procedures

Assessment Conditions

As a minimum, assessors must satisfy applicable regulatory requirements, which include requirements in the Standards for Registered Training Organisations current at the time of assessment.

As a minimum, assessment must satisfy applicable regulatory requirements, which include requirements in the Standards for Registered Training Organisations current at the time of assessment.

Assessment processes and techniques must be appropriate to the language, literacy and numeracy requirements of the work being performed and the needs of the candidate.

Assessment must occur in workplace operational situations. Where this is not appropriate, assessment must occur in simulated workplace operational situations that reflect workplace conditions.

Resources for assessment must include access to:

- a range of relevant exercises, case studies and/or other simulations
- relevant and appropriate materials, tools, equipment and personal protective equipment currently used in industry
- applicable documentation including workplace procedures, industry standards, equipment specifications, regulations, codes of practice and operation manuals.

Links

Companion Volume implementation guides are found in VETNet - https://vetnet.gov.au/Pages/TrainingDocs.aspx?q=1715b9fa-e7bd-441c-bb8d-cf22c9c825a8

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UEPMNT448 Diagnose and repair faults in wind turbine generator control systems

Modification History

Release 1. This is the first release of this unit of competency in the UEP Generation Training Package.

Application

This unit involves the skills and knowledge required to diagnose and repair faults in large scale wind turbine generator control systems.

Diagnosing and repairing faults is the process of optimising the outcomes of large scale wind turbine generator control systems through regular inspections and verification of operational efficiency.

Competency in this unit requires the ability to gather data, interpret data to establish hypothesis about wind turbine generator electrical system fault, repair wind turbine generator electrical system fault and record wind turbine generator electrical system fault. Individuals will, in general, work under supervision in an electrical, electronic and/or mechanical equipment repair workshop or on site.

Power generation maintenance personnel are typically trained and authorised to receive permits to work.

No licensing, legislative or certification requirements apply to this unit at the time of publication.

Note: Workplace practice

The application of the skills and knowledge described in this unit of competency may require a licence or training permit to practice in the workplace, where work is carried out on gas and electrical installations. Additional and/or other conditions may apply under state and territory legislative and regulatory licensing requirements.

Pre-requisite Unit

UEPMNT371 Maintain large scale wind turbine generators

UEPMNT443 Maintain wind turbine generator control systems

UEPMNT445 Diagnose and repair faults in large scale wind turbine generators

UEENEEG108A Troubleshoot and repair faults in low voltage electrical apparatus and circuits

UEENEEE102A Fabricate, assemble and dismantle utilities industry components

UEENEEE104A Solve problems in D.C. circuits

UEENEEE105A Fix and secure electrotechnology equipment

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UEENEEE107A Use drawings, diagrams, schedules, standards, codes and specifications

UEENEEG006A Solve problems in single and three phase low voltage machines

UEENEEG033A Solve problems in single and three phase low voltage electrical apparatus and circuits

UEENEEG063A Arrange circuits, control and protection for general electrical installations

UEENEEG101A Solve problems in electromagnetic devices and related circuits

UEENEEG102A Solve problems in low voltage A.C. circuits

UEENEEG106A Terminate cables, cords and accessories for low voltage circuits

Competency Field

Maintenance

Unit Sector

Electricity generation

Elements and Performance Criteria

ELEMENTS	PERFORMANCE CRITERIA
Elements describe the essential outcomes.	Performance criteria describe the performance needed to demonstrate achievement of the element.
1 Gather data	**1.1** Data logging information and error codes are accessed, in accordance with workplace procedures
	1.2 Sensory data on fault is gathered, in accordance with workplace procedures
	1.3 Documentation is accessed, in accordance with workplace procedures, to support fault finding process
	1.4 Built in fault indicators and error codes are, where appropriate, examined and interpreted
	1.5 Reference to circuit diagrams, manufacturers' specifications, schematics or consultation with technical advisor is used to determine control system circuit function and characteristics
2 Interpret data to establish hypothesis about wind turbine generator control	**2.1** Knowledge of wind turbine generator control systems and performance parameters is applied to interpretation

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system fault		of fault data
	2.2	Wind turbine generator control systems faults are verified, or localised, using appropriate techniques, tools and test equipment, in accordance with workplace procedures
	2.3	Priorities are set for testing or replacement of specific components, wiring and connections in the wind turbine generator control system
3 Repair wind turbine generator control system fault	**3.1**	Risk analysis is undertaken and is communicated to work team and appropriate personnel, in accordance with workplace procedures
	3.2	Safety precautions including circuit isolations, physical barriers and other protective devices or systems are, where appropriate, used in accordance with workplace procedures
	3.3	Tests are conducted to ensure wind turbine generator control system fault has been isolated
	3.4	Faulty components are removed from service and are examined to identify cause of the problem
	3.5	Loose connections or wiring are repaired, in accordance with workplace procedures
	3.6	Faulty parts of wind turbine generator control system are removed and replaced with tested and operational parts
	3.7	Wind turbine generator control systems are tested, in accordance with workplace procedures, to ensure correct operation
	3.8	Repairs to complex faults are escalated, in accordance with workplace procedures to a technical adviser
4 Record wind turbine generator control system fault	**4.1**	Wind turbine generator control system's faulty components and parts are tagged, identified and stored, in accordance with workplace procedures
	4.2	Faults are recorded, in accordance with workplace procedures

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Foundation Skills

Foundation skills essential to performance are explicit in the performance criteria of this unit of competency.

Range of Conditions

Range is restricted to essential operating conditions and any other variables essential to the work environment.

Non-essential conditions may be found in the Companion Volume Implementation Guide.

Unit Mapping Information

This unit replaces and is equivalent to UEPMNT448A Diagnose and repair faults in wind turbine generator control systems.

Links

Companion Volume implementation guides are found in VETNet - https://vetnet.gov.au/Pages/TrainingDocs.aspx?q=1715b9fa-e7bd-441c-bb8d-cf22c9c825a8

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Assessment Requirements for UEPMNT448 Diagnose and repair faults in wind turbine generator control systems

Modification History

Release 1. This is the first release of this unit of competency in the UEP Generation Training Package.

Performance Evidence

Evidence required to demonstrate competence in this unit must be relevant to and satisfy all the requirements of the elements, performance criteria and range of conditions on at least two separate occasions and includes:

- applying Work, Health and Safety (WHS)/Occupational Health and Safety (OHS) requirements including:
  - emergency procedures
  - hazard identification
  - risk control measures
  - safe working practices
- communicating with personnel
- determining permit to work requirements
- gathering data
- implemented legislation, industry standards, codes of practice and regulations
- interpreting data to establish theory about wind turbine generator control system faults
- interpreting fault code and similar data produced by control system monitoring
- recording wind turbine generator control system faults
- removing and repairing wind turbine generator control system faults
- tagging and storing faulty wind turbine generator control system parts
- testing wind turbine generator control system
- undertaking risk analysis
- using manufacturers' specifications and manuals
- utilising safety precautions
- verifying faults

Knowledge Evidence

Evidence required to demonstrate competence in this unit must be relevant to and satisfy all the requirements of the elements, performance criteria and range of conditions and includes knowledge of:

- data collection

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- fault codes and indicators from wind turbine generator control equipment
- fault diagnosis and verification
- installation and/or repair
- isolations
- legislation, industry standards, codes of practice and regulations
- manufacturers' specifications and manuals
- permit to work system
- risk analysis
- safety precautions
- sensor data analysis
- tag and storage of faulty wind turbine generator control system parts
- techniques for replacing damaged wiring
- tests for wind turbine generator control system
- WHS/OHS legislated requirements including:
  - emergency procedures
  - hazard identification
  - risk control measures
  - safe working practices
- wind turbine generator control system, types and characteristics
- workplace documentation
- workplace policies and procedures

Assessment Conditions

As a minimum, assessors must satisfy applicable regulatory requirements, which include requirements in the Standards for Registered Training Organisations current at the time of assessment.

As a minimum, assessment must satisfy applicable regulatory requirements, which include requirements in the Standards for Registered Training Organisations current at the time of assessment.

Assessment processes and techniques must be appropriate to the language, literacy and numeracy requirements of the work being performed and the needs of the candidate.

Assessment must occur in workplace operational situations. Where this is not appropriate, assessment must occur in simulated workplace operational situations that reflect workplace conditions.

Resources for assessment must include access to:

- a range of relevant exercises, case studies and/or other simulations
- relevant and appropriate materials, tools, equipment and personal protective equipment currently used in industry
- applicable documentation including workplace procedures, industry standards, equipment specifications, regulations, codes of practice and operation manuals.

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Links

Companion Volume implementation guides are found in VETNet - https://vetnet.gov.au/Pages/TrainingDocs.aspx?q=1715b9fa-e7bd-441c-bb8d-cf22c9c825a8

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UEPMNT449 Diagnose and repair mechanical systems faults in wind turbine generators

Modification History

Release 1. This is the first release of this unit of competency in the UEP Generation Training Package.

Application

This unit involves the skills and knowledge required to diagnose and repair mechanical system faults in large scale wind turbine generators.

Diagnosing and repairing faults is the process of inspecting large scale wind turbine generators to identify problems and ensure repairs take place. The aim is to ensure that the overall delivery of the large scale wind turbine generators meets operational requirements.

Competency in this unit requires the ability gather data, interpret data to establish theory about wind turbine generator mechanical system faults, repair wind turbine generator mechanical system faults and record wind turbine generator mechanical system faults. Individuals will, in general, work under supervision in an electrical, electronic and/or mechanical equipment repair workshop or on site.

Power generation maintenance personnel are typically trained and authorised to receive permits to work.

No licensing, legislative or certification requirements apply to this unit at the time of publication.

Note: Workplace practice

The application of the skills and knowledge described in this unit of competency may require a licence or training permit to practice in the workplace, where work is carried out on gas and electrical installations. Additional and/or other conditions may apply under state and territory legislative and regulatory licensing requirements.

Pre-requisite Unit

UEPMNT371 Maintain large scale wind turbines generators

UEPMNT444 Maintain wind turbine generator mechanical systems

UEPMNT445 Diagnose and repair faults in large scale wind turbine generators

UEENEEG108A Troubleshoot and repair faults in low voltage electrical apparatus and circuits

UEENEEE102A Fabricate, assemble and dismantle utilities industry components

UEENEEE104A Solve problems in D.C. circuits

UEENEEE105A Fix and secure electrotechnology equipment

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UEENEEE107A Use drawings, diagrams, schedules, standards, codes and specifications

UEENEEG006A Solve problems in single and three phase low voltage machines

UEENEEG033A Solve problems in single and three phase low voltage electrical apparatus and circuits

UEENEEG063A Arrange circuits, control and protection for general electrical installations

UEENEEG101A Solve problems in electromagnetic devices and related circuits

UEENEEG102A Solve problems in low voltage A.C. circuits

UEENEEG106A Terminate cables, cords and accessories for low voltage circuits

Competency Field

Maintenance

Unit Sector

Electricity generation

Elements and Performance Criteria

ELEMENTS	PERFORMANCE CRITERIA
Elements describe the essential outcomes.	Performance criteria describe the performance needed to demonstrate achievement of the element.
1 Gather data	**1.1** Data logging information and error codes are accessed, in accordance with workplace procedures
	1.2 Sensory data on fault is gathered, in accordance with workplace procedures
	1.3 Documentation to support fault finding processes are accessed, in accordance with workplace procedures
	1.4 Built in fault indicators and error codes, where appropriate, are examined and interpreted
	1.5 Circuit or system function and characteristics are determined by reference to circuit diagrams, specifications, schematics or consultation with technical advisor
2 Interpret data to establish hypothesis about wind turbine generator	**2.1** Wind turbine generator mechanical system and performance parameter knowledge is applied to

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mechanical system fault		interpretation of fault data
	2.2	Wind turbine generator mechanical system faults are verified, or localised, using appropriate techniques, tools and test equipment, in accordance with workplace procedures
	2.3	Priorities are set for testing or replacement of specific components, wiring and connections in the wind turbine generator mechanical system
3 Repair wind turbine generator mechanical system fault	**3.1**	Risk analysis is undertaken and is communicated to work team and appropriate personnel, in accordance with workplace procedures
	3.2	Safety precautions including circuit isolations, physical barriers and other protective devices or systems are used, where appropriate, in accordance with workplace procedures
	3.3	Tests are conducted to ensure wind turbine generator mechanical system fault has been isolated
	3.4	Faulty components are removed from service and are examined to identify the cause of the problem
	3.5	Loose connections or wiring are repaired, in accordance with workplace procedures
	3.6	Wind turbine generator mechanical system parts likely to be cause of fault are removed and replaced with tested and operational parts
	3.7	Wind turbine generator mechanical systems are tested, in accordance with workplace procedures, to ensure correct operation
	3.8	Repairs to complex faults are escalated, in accordance with workplace procedures, if required, to a technical adviser
4 Record wind turbine generator mechanical system fault	**4.1**	Wind turbine generator mechanical system faulty components and parts are tagged, identified and stored, in accordance with workplace procedures
	4.2	Faults are recorded, in accordance with workplace procedures

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Foundation Skills

Foundation skills essential to performance are explicit in the performance criteria of this unit of competency.

Range of Conditions

Range is restricted to essential operating conditions and any other variables essential to the work environment.

Non-essential conditions may be found in the Companion Volume Implementation Guide.

Unit Mapping Information

This unit replaces and is equivalent to UEPMNT449A Diagnose and repair mechanical systems faults in wind turbine generators.

Links

Companion Volume implementation guides are found in VETNet - https://vetnet.gov.au/Pages/TrainingDocs.aspx?q=1715b9fa-e7bd-441c-bb8d-cf22c9c825a8

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Assessment Requirements for UEPMNT449 Diagnose and repair mechanical systems faults in wind turbine generators

Modification History

Release 1. This is the first release of this unit of competency in the UEP Generation Training Package.

Performance Evidence

Evidence required to demonstrate competence in this unit must be relevant to and satisfy all the requirements of the elements, performance criteria and range of conditions on at least two separate occasions and includes:

- applying Work, Health and Safety (WHS)/Occupational Health and Safety OHS) requirements including:
  - emergency procedures
  - hazard identification
  - risk control measures
  - safe working practices
- communicating with personnel
- determining permit to work requirements
- diagnosing and repairing faulty wind turbine generator mechanical system
- gathering data
- implementing legislation, industry standards, codes of practice and regulations
- inspecting wind turbine generator mechanical system and wiring
- interpreting data to establish theory about wind turbine generator mechanical system faults
- performing wind turbine generator mechanical system testing
- recording wind turbine generator mechanical system faults
- removing wind turbine generator
- repairing wind turbine generator mechanical system faults
- replacing faulty wind turbine generator mechanical system equipment, components and parts
- using manufacturers' specifications and manuals

Knowledge Evidence

Evidence required to demonstrate competence in this unit must be relevant to and satisfy all the requirements of the elements, performance criteria and range of conditions and includes knowledge of:

- diagnosis and repair for wind turbine mechanical system faults
- legislation, industry standards, codes of practice and regulations

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- manufacturers' specifications and manuals
- permit to work system
- replacement of faulty equipment, components and parts
- report requirements
- test and inspection techniques
- WHS/OHS legislated requirements including:
  - emergency procedures
  - hazard identification
  - risk control measures
  - safe working practices
- workplace documentation
- workplace policies and procedures

Assessment Conditions

As a minimum, assessors must satisfy applicable regulatory requirements, which include requirements in the Standards for Registered Training Organisations current at the time of assessment.

As a minimum, assessment must satisfy applicable regulatory requirements, which include requirements in the Standards for Registered Training Organisations current at the time of assessment.

Assessment processes and techniques must be appropriate to the language, literacy and numeracy requirements of the work being performed and the needs of the candidate.

Assessment must occur in workplace operational situations. Where this is not appropriate, assessment must occur in simulated workplace operational situations that reflect workplace conditions.

Resources for assessment must include access to:

- a range of relevant exercises, case studies and/or other simulations
- relevant and appropriate materials, tools, equipment and personal protective equipment currently used in industry
- applicable documentation including workplace procedures, industry standards, equipment specifications, regulations, codes of practice and operation manuals.

Links

Companion Volume implementation guides are found in VETNet - https://vetnet.gov.au/Pages/TrainingDocs.aspx?q=1715b9fa-e7bd-441c-bb8d-cf22c9c825a8

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UEPMNT450 Test and commission wind turbine generators

Modification History

Release 1. This is the first release of this unit of competency in the UEP Generation Training Package.

Application

This unit involves the skills and knowledge required to conduct testing and commissioning of a wind turbine generator.

Testing and commissioning of wind turbine generators includes the assessment and verification that all equipment and components are operating efficiently and are meeting operational requirements.

Competency in this unit requires the ability to plan work, test systems equipment, test system and complete all work tasks. Individuals will, in general, work under supervision in an electrical, electronic and/or mechanical equipment repair workshop or on site.

Power generation maintenance personnel are typically trained and authorised to receive permits to work.

No licensing, legislative or certification requirements apply to this unit at the time of publication.

Note: Workplace practice

The application of the skills and knowledge described in this unit of competency may require a licence or training permit to practice in the workplace, where work is carried out on gas and electrical installations. Additional and/or other conditions may apply under state and territory legislative and regulatory licensing requirements.

Pre-requisite Unit

UEPMNT371 Maintain large scale wind turbine generators

UEPMNT444 Maintain wind turbine generator mechanical systems

UEPMNT443 Maintain wind turbine generator control systems

UEPMNT448 Diagnose and repair faults in wind turbine generator control systems

UEPMNT449 Diagnose and repair mechanical systems faults in wind turbine generators

UEPMNT445 Diagnose and repair faults in large scale wind turbine generators

UEENEEG108A Troubleshoot and repair faults in low voltage electrical apparatus and circuits

UEENEEE102A Fabricate, assemble and dismantle utilities industry components

UEENEEE104A Solve problems in D.C. circuits

UEENEEE105A Fix and secure electrotechnology equipment

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UEENEEE107A Use drawings, diagrams, schedules, standards, codes and specifications

UEENEEG006A Solve problems in single and three phase low voltage machines

UEENEEG033A Solve problems in single and three phase low voltage electrical apparatus and circuits

UEENEEG063A Arrange circuits, control and protection for general electrical installations

UEENEEG101A Solve problems in electromagnetic devices and related circuits

UEENEEG102A Solve problems in low voltage A.C. circuits

UEENEEG106A Terminate cables, cords and accessories for

Competency Field

Maintenance

Unit Sector

Electricity generation

Elements and Performance Criteria

ELEMENTS	PERFORMANCE CRITERIA
Elements describe the essential outcomes.	Performance criteria describe the performance needed to demonstrate achievement of the element.
1 Plan and prepare for work	**1.1** Requirements including scope of work and assigned roles are identified and confirmed with appropriate personnel or by site inspection, in accordance with workplace procedures
	1.2 Work, Health and Safety (WHS)/Occupational Health and Safety (OHS) regulations, legislative requirements, industry standards, codes of practice, manufacturers' specifications, environmental obligations and workplace procedures are reviewed in preparation for work
	1.3 Resources are obtained and inspected for compliance with job specification
	1.4 Relevant plans, drawings and manuals are selected and used, in accordance with workplace procedures
	1.5 Correct materials and components for work are obtained and inspected for compliance with job

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		specification
	1.6	Commissioning is planned, sequenced and prioritised, in accordance with workplace procedures
	1.7	Potential hazards are identified and risk control measures are implemented, in accordance with workplace procedures
	1.8	Work area is accessed and prepared, in accordance with workplace procedures
2 Test systems equipment	**2.1**	Isolations are confirmed, where appropriate, in accordance with workplace procedures
	2.2	Wind turbine generator system equipment is visually inspected to ensure absence of any damage, defects and deterioration, in accordance with workplace procedures and commissioning plan
	2.3	Wind turbine generator system equipment is tested, in conjunction with other related systems and equipment, to ensure correct operation, in accordance with workplace procedures and commissioning plan
	2.4	Wind turbine generator wiring systems are checked and tested, in conjunction with other related systems and equipment, in accordance with workplace procedures and commissioning plan
3 Test system	**3.1**	Isolations are confirmed, where appropriate, in accordance with workplace procedures
	3.2	Wind turbine generator system, plant and equipment are set up and calibrated, in accordance with workplace procedures, operational requirements and manufacturers' specifications
	3.3	Wind turbine generator system is commissioned using appropriate plans, drawings and manuals, in accordance with workplace procedures and commissioning plan
	3.4	Wind turbine generator system is commissioned, in conjunction with other related systems and equipment, in accordance with workplace procedures and commissioning plan
	3.5	Wind turbine generator equipment is commissioned, in accordance with workplace procedures and

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		commissioning plan
	3.6	Faulty wind turbine generator equipment is repaired or reported, in accordance with workplace procedures
	3.7	Final inspection is carried out, in accordance with workplace procedures and commissioning plan
4 Complete work	**4.1**	Wind turbine generator commissioning is completed and appropriate personnel are notified, in accordance with workplace procedures
	4.2	Work area is cleared of waste, cleaned, restored and secured, in accordance with workplace procedures
	4.3	Tools and equipment are maintained and stored, in accordance with workplace procedures
	4.4	Work completion details are finalised, in accordance with workplace procedures

Foundation Skills

Foundation skills essential to performance are explicit in the performance criteria of this unit of competency.

Range of Conditions

Range is restricted to essential operating conditions and any other variables essential to the work environment.

Non-essential conditions may be found in the Companion Volume Implementation Guide.

Unit Mapping Information

This unit replaces and is equivalent to UEPMNT450A Test and commission wind turbine generators.

Links

Companion Volume implementation guides are found in VETNet - https://vetnet.gov.au/Pages/TrainingDocs.aspx?q=1715b9fa-e7bd-441c-bb8d-cf22c9c825a8

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Assessment Requirements for UEPMNT450 Test and commission wind turbine generators

Modification History

Release 1. This is the first release of this unit of competency in the UEP Generation Training Package.

Performance Evidence

Evidence required to demonstrate competence in this unit must be relevant to and satisfy all the requirements of the elements, performance criteria and range of conditions on at least two separate occasions and includes:

- applying Work, Health and Safety (WHS)/Occupational Health and Safety (OHS) requirements including:
  - emergency procedures
  - hazard identification
  - risk control measures
  - safe working practices
- communicating with personnel
- completing work as per scheduled requirements
- determining permit to work requirements
- implementing legislation, industry standards, codes of practice and regulations
- inspecting wind turbine generator system and wiring
- planning for testing and commissioning wind turbine generator work
- selecting materials
- testing and commissioning wind turbine generator system
- testing wind turbine generator systems equipment
- undertaking isolations
- using data analysis techniques and tools
- using manufacturers' specifications and manuals
- utilising tools and equipment

Knowledge Evidence

Evidence required to demonstrate competence in this unit must be relevant to and satisfy all the requirements of the elements, performance criteria and range of conditions and includes knowledge of:

- equipment and materials required
- installation, testing and commissioning practices

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- isolations
- layout of wind farm plant, and operation of equipment
- legislation, industry standards, codes of practice and regulations
- manufacturers' specifications and manuals
- manufacturers' wind turbine generator components and parts
- permit to work system
- test and measurement instruments and techniques for use
- types of wind turbine generators and wiring systems
- typical arrangements of wind farm power production plant
- WHS/OHS legislated requirements including:
  - emergency procedures
  - hazard identification
  - risk control measures
  - safe working practices
- workplace documentation
- workplace policies and procedures

Assessment Conditions

As a minimum, assessors must satisfy applicable regulatory requirements, which include requirements in the Standards for Registered Training Organisations current at the time of assessment.

As a minimum, assessment must satisfy applicable regulatory requirements, which include requirements in the Standards for Registered Training Organisations current at the time of assessment.

Assessment processes and techniques must be appropriate to the language, literacy and numeracy requirements of the work being performed and the needs of the candidate.

Assessment must occur in workplace operational situations. Where this is not appropriate, assessment must occur in simulated workplace operational situations that reflect workplace conditions.

Resources for assessment must include access to:

- a range of relevant exercises, case studies and/or other simulations
- relevant and appropriate materials, tools, equipment and personal protective equipment currently used in industry
- applicable documentation including workplace procedures, industry standards, equipment specifications, regulations, codes of practice and operation manuals.

Links

Companion Volume implementation guides are found in VETNet - https://vetnet.gov.au/Pages/TrainingDocs.aspx?q=1715b9fa-e7bd-441c-bb8d-cf22c9c825a8

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UEPOPL001 Licence to operate a steam turbine

Modification History

Release 1. This is the first release of this unit of competency in the UEP Generation Training Package.

Application

This unit specifies the outcomes required to operate a steam turbine for licensing purposes, steam turbine means equipment that is driven by steam acting on a turbine or rotor to cause a rotary motion.

It covers the operation of any steam turbine (except a steam turbine that produces a power output of less than 500 kW) that:

- is multi-wheeled
- is capable of a speed greater than 3600 rpm or
- uses attached condensers or
- a multi-staged heat exchange extraction process.

This unit requires the operator to plan the work, carry out preoperational safety checks, start the steam turbine, monitor steam turbine operation and shutdown the steam turbine.

A person performing this work is required to hold a turbine operation high risk work (HRW) licence.

Licensing/Regulatory information

This unit is based on the licensing requirements of Part 4.5 of the Model Work Health and Safety (WHS) Regulations, HRW and meets Commonwealth, state and territory HRW licensing requirements.

Any alteration to this unit would result in a unit that would not be acceptable to Work, Health and Safety (WHS)/Occupational Health and Safety (OHS) regulators for the purpose of licensing.

Pre-requisite Unit

There are no prerequisite units

Competency Field

Licensing

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Unit Sector

Electricity generation

Elements and Performance Criteria

ELEMENTS	PERFORMANCE CRITERIA
Elements describe the essential outcomes.	Performance criteria describe the performance needed to demonstrate achievement of the element.
1 Plan work	**1.1** Type of operations to be conducted for steam turbine are assessed and prepared
	1.2 Steam turbine operations are planned, in accordance with procedures
	1.3 Personal Protective Equipment (PPE) is selected for use, ensuring statutory requirements and procedures are followed
	1.4 Hazards and potential hazards in work area are identified and assessed for risk, and controls recommended are consistent with appropriate standards
	1.5 Appropriate communication methods are identified, in accordance with procedures
2 Start-up steam turbine	**2.1** Downstream user of output power from steam turbine is advised of start up
	2.2 Controls are implemented for identified hazards and potential hazards in work area consistent with appropriate standards
	2.3 Availability of quality steam from upstream provider is confirmed
	2.4 Preoperational safety checks of steam turbine are conducted, in accordance with procedures
	2.5 Start-up checks are performed upon ancillary plant
	2.6 Maintenance requirements are identified and reported, in accordance with procedures
	2.7 Steam turbine is started and brought up to speed and placed on line safely, in accordance with procedures, including performance of start-up checks

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3	**Monitor steam turbine operation**	**3.1** Steam turbine is monitored, in accordance with required procedures, including performing of operational checks and fault finding
		3.2 Operating log is maintained clearly and accurately, in accordance with established procedures
		3.3 Operating status of steam turbine is diagnosed and verified
		3.4 Status of steam turbine is communicated to other operational personnel, including downstream users of steam turbine output power
		3.5 Steam turbine emergencies and contingencies are dealt with, in accordance with local workplace procedures, manufacturers' specifications and environmental requirements
4	**Shut down steam turbine**	**4.1** Energy isolation procedures are followed
		4.2 Routine shutdown of steam turbine is performed, in accordance with operational and manufacturers' requirements and procedures, including performing shut down checks
		4.3 Maintenance requirements are identified, recorded and reported, in accordance with procedures

Foundation Skills

Foundation skills essential to performance are explicit in the performance criteria of this unit of competency.

Range of Conditions

Range is restricted to essential operating conditions and any other variables essential to the work environment.

Non-essential conditions may be found in the Companion Volume Implementation Guide.

appropriate standards must include	but not be limited to: • codes of practice • state, territory and federal legislation • Australian standards • manufacturers’ specifications

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communicated and communication must include	• but not be limited to:
	  • verbal
	  • written
	  • telephone
	  • two-way radio
	  • log records
	  • computer record systems

emergencies must include	• but not be limited to:
	  • fire
	  • bomb threat
	  • terrorism
	  • personal accidents
	  • chemical spills
	  • major steam leaks
	  • major water leaks
	  • and flooding
	  • natural disasters

faults must include	• but not be limited to:
	  • abnormal operating conditions
	  • loss of a major auxiliary
	  • steam turbine water ingress
	  • wet steam
	  • excessively high turbine and turbine valves heating or cooling rates and/or differentials
	  • loss of condenser vacuum
	  • condenser tube leak
	  • high dissolved oxygen
	  • conductivity
	  • high steam turbine bearing temperatures or vibration
	  • high or low bearing oil temperatures
	  • loss of steam turbine bearing oil flow or pressure
	  • low or high pressure heaters malfunction
	  • actuator, valve, mechanical and electrical faults or failure
	  • instrument failure
	  • steam turbine protection

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hazards must include	• but not be limited to:
	  • chemical hazards
	  • thermal hazards
	  • manual handling hazards
	  • guarding of machinery requirements
	  • illumination of work area
	  • rubbish and combustibles in area
	  • leakage of steam
	  • leakage of fuel
	  • obstructions in the work area
	  • fire
	  • noise
	  • vibration
	  • water and working at heights

operational checks must include	• but not be limited to:
	  • quality of steam supply
	  • cooling water system
	  • condenser operation
	  • position and operation of valves and fittings
	  • cylinder drainage system
	  • lubrication system, speed control, vibration level and steam reticulation line pressure
	  • operation of control or safety devices

Personal Protective Equipment (PPE) must include	• but not be limited to:
	  • prescribed under legislation, regulations, codes of practice and workplace policies and procedures
	  • hard hat, safety boots, gloves and high visibility clothing
	  • breathing, hearing, sight, skin and sun protection
	  • fall arrest equipment such as harnesses and lanyards, horizontal lines and inertia reel

preoperational safety checks must include	• but not be limited to:
	  • steam supply system
	  • position and operation of steam turbine valves
	  • safety devices

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	• overspeed shutdown • pressure relieve devices • speed governor • exhaust system • auxiliary equipment • lubrication system
procedures must include	• but not be limited to: • manufacturers' instructions, specifications or checklists • industry operating procedures • workplace procedures including instructions, operating procedures and checklists
recorded information must include	• but not be limited to: • operations and maintenance of steam turbine equipment • difficulties or issues • environmental issues • recommendations for future work • results • costs • hazards • incidents or injuries • dangerous occurrences or equipment malfunctions • log book and proformas • production reports and maintenance records
simulated training must include	• reproduction of conditions in working situation • enabling tasks to be learned and practised safely and economically
shut down checks must include	• but not be limited to: • checks of cooling down process • steam supply isolated • load on steam turbine • auxiliary equipment shutdown • cylinder drain system • isolation from any common connection
start-up checks must include	• but not be limited to: • position and operation of valves and

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	fittings • operation of lubrication system • operation of drainage system • steam quality • heat input • operation of auxiliary equipment • freedom of rotation of steam turbine • steam turbine warmup • operation of steam traps and steam line purge systems • warm up of reticulation system • reticulation line pressure
industrial equipment must include	• where steam acts on a steam turbine or rotor to cause a rotary motion with any or all the following features: • attached condensers • multi-wheeled • multi-staged heat exchange extraction process at speed greater than 3600 rpm may include: • axial flow • back pressure • condensing • impulse • non-condensing pass out • radial flow • reaction and velocity compounding steam turbines with a power output of greater than 500kw • the operation may be assisted by remote indicators of plant status and other parameters monitored (e.g. central control stations), in wet, noisy, dusty or hot areas or during continuous operation
steam turbine emergencies and contingencies must include	• but not be limited to: • identification of type of emergency • isolation of steam supply • selection and application of appropriate firefighting equipment • notification of upstream steam supplier • operation of steam turbine only when safe to do so

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testing must include	• but not be limited to:
	  • loss of a major auxiliary controls response checks
	  • standby plant tests
	  • valves operating checks
	  • emergency governor operation test
	  • performance tests
	  • alarm and protection tests

Unit Mapping Information

This unit replaces and is equivalent to UEPOPL001A Licence to operate a steam turbine.

Links

Companion Volume implementation guides are found in VETNet - https://vetnet.gov.au/Pages/TrainingDocs.aspx?q=1715b9fa-e7bd-441c-bb8d-cf22c9c825a8

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Assessment Requirements for UEPOPL001 Licence to operate a steam turbine

Modification History

Release 1. This is the first release of this unit of competency in the UEP Generation Training Package.

Performance Evidence

Evidence required to demonstrate competence in this unit must be relevant to and satisfy all the requirements of the elements, performance criteria and range of conditions on at least one occasion and includes:

- communicating effectively and working safely with others in the work area
- completing verification of problems and steam turbine equipment faults and demonstrating appropriate response procedures
- compliance with Commonwealth, state or territory regulations for the acquisition of a high risk work licence for steam turbine operation
- compliance with legislation, regulations, standards, codes of practice and established safe practices and procedures for starting, operating, shutting down and maintaining a steam turbine
- compliance with organisational and site policies and procedures including quality requirements and state or territory legislation applicable to workplace operations
- compliance with WHS and environmental regulations, policies and procedures
- controlling and monitoring any ancillary equipment which may be connected or interfaced to the steam turbine recording accurately and maintaining information related to operation of a steam turbine
- identifying hazards associated with the operation of the steam turbine and put in place effective hazard controls for those hazards identified
- performing efficiently and safely when starting, operating, shutting down and maintaining a steam turbine
- starting up, monitoring and shutting down a steam turbine effectively which meets the definition of this licence class
- undertaking diagnostic and testing techniques as applied to steam turbines
- using appropriate communication techniques with colleagues and others
- utilising relevant tools and equipment

Knowledge Evidence

Evidence required to demonstrate competence in this unit must be relevant to and satisfy all the requirements of the elements, performance criteria and range of conditions and includes knowledge of:

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- basic principles of heat transfer and thermodynamics
- Commonwealth, state or territory WHS legislation, regulations, standards and codes of practice relevant to the full range of techniques for operating steam turbines
- confined space awareness and the limits for entry into a confined space
- environmental protection requirements relating to the disposal of waste material and storage of environmentally hazardous materials
- established communication channels and protocols in the workplace
- organisational and workplace standards, requirements, policies and procedures for starting, operating, shutting down and maintaining a steam turbine
- procedures for the recording, reporting and maintenance of workplace records and information
- safety data sheets and material handling methods
- steam turbine capabilities and components
- steam turbine fault finding and problem solving techniques
- steam turbine operations and operating techniques
- steam turbine safety devices and testing techniques
- steam turbine speed control equipment
- system components and their interaction with other plant and equipment.
- typical routine problems encountered in the process and with equipment and adjustments required for correction
- understanding of the hierarchy of hazard identification and control

Assessment Conditions

Assessments must be conducted by an assessor accredited for this High Risk Work (HRW) licence class in the Commonwealth, state or territory where the licence will be obtained (i.e. an assessor authorised by a Commonwealth, state or territory WHS/OHS regulator).

As a minimum, assessors must satisfy applicable regulatory requirements, which include requirements in the Standards for Registered Training Organisations current at the time of assessment.

As a minimum, assessment must satisfy applicable regulatory requirements, which include requirements in the Standards for Registered Training Organisations current at the time of assessment.

Assessment processes and techniques must be appropriate to the language, literacy and numeracy requirements of the work being performed and the needs of the candidate.

Assessment of performance must be undertaken in the workplace and/or under realistic workplace conditions which typically reflect:

- performing tasks and activities within timelines that would be expected in a workplace
- standard and authorised work practices, safety requirements and environmental constraints
- using full scale equipment

The use of simulators in the assessment of this unit of competency is acceptable.

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Resources for assessment must include access to:

- a range of relevant exercises, case studies and/or other simulations
- relevant and appropriate materials, tools and equipment used in industry including:
  - Personal Protective Equipment (PPE) for performance assessment
  - appropriate safety equipment in safe condition
  - appropriate steam turbine and associated equipment in safe condition
- communication equipment, as required, applicable documentation including workplace procedures, industry standards, equipment specifications, regulations, codes of practice and operation manuals.

Links

Companion Volume implementation guides are found in VETNet - https://vetnet.gov.au/Pages/TrainingDocs.aspx?q=1715b9fa-e7bd-441c-bb8d-cf22c9c825a8

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UEPOPL002 Licence to operate a reciprocating steam engine

Modification History

Release 1. This is the first release of this unit of competency in the UEP Generation Training Package.

Application

This unit specifies the outcomes required to operate a reciprocating steam engine for licensing purposes, which includes the operation of steam equipment where the steam acts upon a piston under pressure.

Reciprocating steam engine means equipment that is driven by steam acting on a piston causing the piston to move and includes and expanding (steam) reciprocating engine.

High risk work is classed as the operation of a reciprocating steam engine where the diameter of any piston exceeds 250 millimetres.

This unit requires the operator to plan the work, carry out pre-operational safety checks, start the reciprocating steam engine, monitor the reciprocating steam engine operation, carry out shut down of reciprocating steam engine for operational and maintenance purposes.

A person performing this work is required to hold a reciprocating steam engine operation high risk work (HRW) licence.

Licensing/Regulatory information

This unit is based on the licensing requirements of Part 4.5 of the Model Work Health and Safety (WHS) Regulations, HRW and meets Commonwealth, state and territory HRW licensing requirements.

Any alteration to this unit would result in a unit that would not be acceptable to Work, Health and Safety (WHS)/Occupational Health and Safety (OHS) regulators for the purpose of licensing.

Pre-requisite Unit

There are no prerequisite units.

Competency Field

Licensing There are no prerequisite units.

Unit Sector

Electricity generation

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Elements and Performance Criteria

ELEMENTS	PERFORMANCE CRITERIA
Elements describe the essential outcomes.	Performance criteria describe the performance needed to demonstrate achievement of the element.
1 Plan work	**1.1** Types of operations to be conducted for a reciprocating steam engine are assessed and prepared
	1.2 Personal Protective Equipment (PPE) is selected for use, ensuring statutory requirements and procedures are followed
	1.3 Hazards and potential hazards in work area are identified and assessed for risk and controls recommended are consistent with appropriate standards
	1.4 Pre-operational safety checks of reciprocating steam engine and equipment are conducted, in accordance with statutory requirements and procedures
	1.5 Maintenance requirements and equipment faults are identified and reported, in accordance with procedures
	1.6 Communication methods are identified according to procedures
2 Start reciprocating steam engine	**2.1** Controls are implemented for hazards in work area consistent with industry standards
	2.2 Start-up checks are performed and the reciprocating steam engine is brought on line safely, in accordance with statutory requirements and procedures
	2.3 Maintenance requirements are identified and reported, in accordance with procedures
3 Monitor reciprocating steam engine operation	**3.1** Reciprocating steam engine is monitored, in accordance with statutory requirements and workplace procedures, including undertaking operational checks
	3.2 Operating log is maintained clearly and accurately, in accordance with statutory requirements and procedures
	3.3 Information regarding reciprocating steam engine, its status and operation is communicated clearly in accordance with procedures

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4 Shut down reciprocating steam engine	**4.1**	Engine is shut down in accordance with statutory requirements and procedures, including shut down checks and shut down checks for maintenance
	4.2	Reciprocating steam engine is isolated in accordance with procedures
	4.3	Maintenance requirements are identified, recorded and reported in accordance with procedures

Foundation Skills

Foundation skills essential to performance are explicit in the performance criteria of this unit of competency.

Range of Conditions

Range is restricted to essential operating conditions and any other variables essential to the work environment.

Non-essential conditions may be found in the Companion Volume Implementation Guide.

appropriate standards must include	but not be limited to: • codes of practice • legislation • Australian Standards • manufacturers' specifications
communicated and/or communication must include	but are be limited to: • verbal • written • telephone • two-way radio • log records • computer record systems
emergencies must include	but not be limited to: • fire • bomb threat • terrorism • personal accidents • chemical spills • major steam leaks • major water leaks

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	• flooding • natural disasters
equipment must include	but not be limited to: • engine and auxiliary plant • engine lubrication and power or control oil systems • hydraulic oil system • pump • compressed air system • steam supply system • cylinder exhaust system • computers with equipment control functions • supervisory, alarm, protection and control equipment • relevant maintenance equipment including equipment for: • lock out for protecting operators and co-workers from accidental injury • emergency shutdown stopping • extinguishing fires • organisational first aid requirements • evacuation
equipment faults must include	but not be limited to: • abnormal operating conditions • loss of a major auxiliary • excessively high engine and engine valves heating rates or differentials • high engine bearing temperatures or vibration • high pressure heater malfunctions • mechanical or electrical faults or failure • failed field devices • engine protection
hazards must include	but not be limited to: • chemical hazards • thermal hazards • manual handling hazards • guarding of machinery requirements • illumination of work area • rubbish and combustibles in area

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	• leakage of steam • leakage of fuel • obstructions in work area • fire • noise • vibration • water • working at heights
operational checks must include	but not be limited to: • supply and quality of steam and line pressure • exhaust system • safety devices • speed governor • vibration level • lubrication system • operation and function of valves and fittings • cylinder drainage system • operation of control and/or safety devices
Personal Protective Equipment (PPE) must include	but not be limited to: • prescribed under legislation, regulation and codes of practice • workplace policies and practices • hard hat • safety boots • gloves • high visibility clothing • breathing, hearing, sight, skin and sun protection • fall arrest equipment such as harnesses and lanyards, horizontal life lines and inertia reel
preoperational safety checks may include	but not be limited to: • supply steam system • position and operation of engine valves • lubrication system • cylinder drainage system • exhaust system • auxiliary equipment • safety devices • over speed shut down • pressure relief devices

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	• speed governor
procedures must include	but not be limited to: • manufacturers' guidelines (e.g. instructions, specifications or checklists) • industry operating procedures • workplace procedures (e.g. work instructions, operating procedures and checklists)
operation of steam equipment must include	• where the steam acts upon a piston under pressure where this action of the steam forces the piston to move. • the definition includes all expanding (steam) reciprocating engines, with any piston diameter of greater than 250 millimetres
recorded must include	but not be limited to: • operations and maintenance of reciprocating steam engine equipment • difficulties or issues • environmental issues • recommendations for future work • results • costs • hazards • incidents or injuries • dangerous occurrences or equipment • malfunctions using log books • proformas • production reports • maintenance records
shutdown checks must include	but not be limited to: • steam supply • cooling process • load on engine • cylinder drains • auxiliary equipment
shutdown checks for maintenance must include	but not be limited to: • checks of cooling down process • isolation of steam • isolation from any common connection • opening of all access points required for

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	inspection
a simulator must include	• a device used especially in training to reproduce the conditions of the working situation, enabling tasks to be learned and practised safely and economically
start-up checks must include	but not be limited to: • heat input • steam supply system • steam traps and steam line purge systems operation • engine warmed up • lubrication system • drainage system • operation and position of engine valves and fittings • operation of auxiliary equipment • freedom of rotation of engine • warm up of reticulation system • reticulation line pressure
testing must include	but not be limited to: • loss of a major auxiliary controls response checks • standby plant cut-in tests • valves operating checks • on load engine valve and emergency governor operation test • performance tests • valve operation tests • alarm and protection tests

Unit Mapping Information

This unit replaces and is equivalent to UEPOPL002A Licence to operate a reciprocating steam engine.

Links

Companion Volume implementation guides are found in VETNet - https://vetnet.gov.au/Pages/TrainingDocs.aspx?q=1715b9fa-e7bd-441c-bb8d-cf22c9c825a8

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Assessment Requirements for UEPOPL002 Licence to operate a reciprocating steam engine

Modification History

Release 1. This is the first release of this unit of competency in the UEP Generation Training Package.

Performance Evidence

Evidence required to demonstrate competence in this unit must be relevant to and satisfy all the requirements of the elements, performance criteria and range of conditions on at least one occasion and includes:

- communicating effectively and working safely with others in the work area
- completing verification of problems and equipment faults and demonstrate appropriate response procedures
- compliance with Commonwealth, state or territory regulations for the acquisition of a high risk work licence for reciprocating steam engine operation
- compliance with legislation, regulations, standards, codes of practice and established safe practices and procedures for starting, operating, shutting down and maintaining a reciprocating steam engine
- compliance with organisational and site policies and procedures including quality requirements and state or territory legislation applicable to workplace operations
- compliance with WHS and environmental regulations, policies and procedures
- identifying hazards associated with the operation of the reciprocating steam engine and put in place effective hazard controls for those hazards identified
- performing efficiently and safely when starting, operating, shutting down and maintaining a reciprocating steam engine
- recording accurately and maintaining information relating to operation of a reciprocating steam engine
- starting up, monitoring and shutting down a reciprocating steam engine effectively that meets the definition of this licence class
- undertaking diagnostic and testing techniques for reciprocating steam engines
- using appropriate communication techniques with colleagues and others
- utilising relevant tools and equipment

Knowledge Evidence

Evidence required to demonstrate competence in this unit must be relevant to and satisfy all the requirements of the elements, performance criteria and range of conditions and includes knowledge of:

- basic principles of heat transfer and thermodynamics

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- Commonwealth, state or territory WHS legislation, regulations, standards and codes of practice relevant to the full range of techniques for operating reciprocating steam engines
- confined space awareness and the limits for entry into a confined space
- engine speed control equipment
- environmental protection requirements relating to the disposal of waste material and storage of environmentally hazardous materials
- established communication channels and protocols in the workplace
- hierarchy of hazard identification and control
- organisational and workplace standards, requirements, policies and procedures for starting, operating, shutting down and maintaining a reciprocating steam engine
- procedures for the recording, reporting and maintenance of workplace records and information
- reciprocating steam engine capabilities and components
- reciprocating steam engine fault finding and problem solving techniques
- reciprocating steam engine operations and operating techniques
- reciprocating steam engine safety devices and testing techniques
- routine problems encountered in the process and with equipment and adjustments required for correction
- safety data sheets and material handling methods
- system components and their interaction with other plant and equipment
- types of tools and equipment and procedures for use, operation and maintenance

Assessment Conditions

Assessments must be conducted by an assessor accredited for this High Risk Work (HRW) licence class in the Commonwealth, state or territory where the licence will be obtained (i.e. an assessor authorised by a Commonwealth, state or territory WHS/OHS regulator).

As a minimum, assessors must satisfy applicable regulatory requirements, which include requirements in the Standards for Registered Training Organisations current at the time of assessment.

As a minimum, assessment must satisfy applicable regulatory requirements, which include requirements in the Standards for Registered Training Organisations current at the time of assessment.

Assessment processes and techniques must be appropriate to the language, literacy and numeracy requirements of the work being performed and the needs of the candidate.

Assessment of performance must be undertaken in the workplace and/or under realistic workplace conditions which typically reflect:

- performing tasks and activities within timelines that would be expected in a workplace
- standard and authorised work practices, safety requirements and environmental constraints
- using full scale equipment

The use of simulators in the assessment of this unit of competency is not acceptable.

Resources for assessment must include access to:

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- a range of relevant exercises, case studies and/or other simulations
- relevant and appropriate materials, tools and equipment and currently used in industry including:
  - Personal Protective Equipment (PPE) for performance assessment
  - appropriate safety equipment in safe condition
  - appropriate reciprocating steam engine and associated equipment in safe condition
- communication equipment, as required applicable documentation including workplace procedures, industry standards, equipment specifications, regulations, codes of practice and operation manuals.

Links

Companion Volume implementation guides are found in VETNet - https://vetnet.gov.au/Pages/TrainingDocs.aspx?q=1715b9fa-e7bd-441c-bb8d-cf22c9c825a8

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UEPOPS202 Apply quality systems to work

Modification History

Release 1. This is the first release of this unit of competency in the UEP Generation Training Package.

Application

This unit involves the skills and knowledge required to apply a quality assurance system to work.

Quality control is a process to ensure that significant variations in quality are kept to a minimum. Quality control in a power generation facility will focus on a set of procedures intended to ensure that personnel, plant and equipment operate smoothly and efficiently.

Competency in this unit requires the ability to plan and prepare quality procedures, conduct quality system practices and initiate changes to quality systems. Individuals will, in general, work as an operator in a power generation facility.

No licensing, legislative or certification requirements apply from this unit at the time of publication.

Note: Workplace practice

The application of the skills and knowledge described in this unit may require a licence or training permit to practice in the workplace where work is carried out on gas and electrical installations. Additional conditions may apply under state and territory legislative and regulatory licensing requirements.

Pre-requisite Unit

There are no prerequisite units.

Competency Field

Operations

Unit Sector

Electricity generation

Elements and Performance Criteria

ELEMENTS **PERFORMANCE CRITERIA**

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Elements describe the essential outcomes.	Performance criteria describe the performance needed to demonstrate achievement of the element.
1 Plan and prepare to work with quality systems	**1.1** Quality procedures are identified from quality system and Work, Health and Safety (WHS)/Occupational Health and Safety (OHS) regulations, in accordance with workplace procedures
	1.2 Performance objectives are identified, in accordance with workplace procedures and Quality Management System (QMS)
	1.3 Work plan is structured, in accordance with workplace procedures and site requirements, to ensure quality standards are achieved
2 Conduct quality system practices	**2.1** Quality assurance processes and procedures are implemented, in accordance with workplace procedures and manufacturers' recommendations
	2.2 Work is monitored against quality standards and sustainable energy principles, and are clarified with appropriate personnel, in accordance with workplace procedures
	2.3 Allocated work tasks are completed, in accordance with workplace procedures and quality assurance requirements
3 Initiate changes to quality systems	**3.1** Improvements to quality assurance procedures are identified by analysis of system outcomes, in accordance with workplace procedures and quality assurance requirements
	3.2 Extent of proposed changes to quality procedures are investigated, in accordance with workplace procedures and quality assurance
	3.3 Proposed improvements are negotiated and confirmed with appropriate personnel, in accordance with workplace procedures and quality assurance requirements

Foundation Skills

Foundation skills essential to performance are explicit in the performance criteria of this unit of competency.

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Range of Conditions

Range is restricted to essential operating conditions and any other variables essential to the work environment.

Non-essential conditions may be found in the Companion Volume Implementation Guide.

Unit Mapping Information

This unit replaces and is equivalent to UEPOPS202B Apply quality systems to work.

Links

Companion Volume implementation guides are found in VETNet - https://vetnet.gov.au/Pages/TrainingDocs.aspx?q=1715b9fa-e7bd-441c-bb8d-cf22c9c825a8

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Assessment Requirements for UEPOPS202 Apply quality systems to work

Modification History

Release 1. This is the first release of this unit of competency in the UEP Generation Training Package.

Performance Evidence

Evidence required to demonstrate competence in this unit must be relevant to and satisfy all the requirements of the elements, performance criteria and range of conditions on at least two separate occasions and includes:

- applying continuous improvement techniques
- applying Work, Health and Safety (WHS)/Occupational Health and Safety (OHS) legislated requirements including:
  - emergency procedures
  - risk control measures
  - safe working practices
- communicating with personnel
- complying with legislation, industry standards, codes of practice and regulations
- contributing to quality control audits
- identifying quality procedural change requirements
- improving quality control procedures
- initiating changes to quality assurance processes and procedures
- planning and preparing for quality control
- using recording procedures for documenting
- utilising sustainable energy principles and practices
- working with quality assurance procedures, tools and techniques

Knowledge Evidence

Evidence required to demonstrate competence in this unit must be relevant to and satisfy all the requirements of the elements, performance criteria and range of conditions and includes knowledge of:

- continuous improvement
- continuous improvement techniques
- legislation, industry standards, codes of practice and regulations
- principles of sustainable energy practice
- procedural quality change requirements

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- quality control
- quality control audits including improvement implementation
- Quality Management System (QMS) tools and techniques
- WHS/OHS including:
  - emergency procedures
  - risk control measures
  - safe working practices
- workplace documentation
- workplace policies and procedures

Assessment Conditions

As a minimum, assessors must satisfy applicable regulatory requirements, which include requirements in the Standards for Registered Training Organisations current at the time of assessment.

As a minimum, assessment must satisfy applicable regulatory requirements, which include requirements in the Standards for Registered Training Organisations current at the time of assessment.

Assessment processes and techniques must be appropriate to the language, literacy and numeracy requirements of the work being performed and the needs of the candidate.

Assessment must occur in workplace operational situations. Where this is not appropriate, assessment must occur in simulated workplace operational situations that reflect workplace conditions.

Resources for assessment must include access to:

- a range of relevant exercises, case studies and/or other simulations
- relevant and appropriate materials, tools, equipment and personal protective equipment currently used in industry
- applicable documentation including workplace procedures, industry standards, equipment specifications, regulations, codes of practice and operation manuals.

Links

Companion Volume implementation guides are found in VETNet - https://vetnet.gov.au/Pages/TrainingDocs.aspx?q=1715b9fa-e7bd-441c-bb8d-cf22c9c825a8

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UEPOPS203 Operate and monitor communications system

Modification History

Release 1. This is the first release of this unit of competency in the UEP Generation Training Package.

Application

This unit involves the skills and knowledge required to operate and monitor a communications system.

A communications system includes the various processes, both formal and informal, by which information is passed between personnel within a power generation facility itself and its clients, customers and stakeholders.

Competency in this unit requires the ability to plan work, operate and monitor a communications system and completion of all documentation. Individuals will, in general, work under supervision, in a power generation facility as an operator.

No licensing, legislative or certification requirements apply from this unit at the time of publication.

Note: Workplace practice

The application of the skills and knowledge described in this unit may require a licence or training permit to practice in the workplace where work is carried out on gas and electrical installations. Additional conditions may apply under state and territory legislative and regulatory licensing requirements.

Pre-requisite Unit

There are no prerequisite units.

Competency Field

Operations

Unit Sector

Electricity generation

Elements and Performance Criteria

ELEMENTS **PERFORMANCE CRITERIA**

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Elements describe the essential outcomes.	Performance criteria describe the performance needed to demonstrate achievement of the element.
1 Select and use equipment	**1.1** An appropriate medium for communication is determined from the available options and is used, in accordance with workplace procedures
	1.2 Communication procedures for opening, passing and receiving messages are implemented, in accordance with workplace procedures
	1.3 Communication equipment is used, in accordance with workplace procedures, Work, Health and Safety (WHS)/Occupational Health and Safety (OHS) guidelines and manufacturers' specifications
	1.4 Limitations of communication system are identified and alternatives are used, in accordance with workplace procedures
2 Monitor communication system	**2.1** Data acquisition is monitored and assessed for quality and action is taken, in accordance with workplace procedures
	2.2 Need for communication assistance is identified and addressed, in accordance with workplace procedures and job requirements
3 Complete documentation	**3.1** Communication equipment problems and status is reported, in accordance with workplace procedures
	3.2 Documentation is updated, in accordance with workplace procedures

Foundation Skills

Foundation skills essential to performance are explicit in the performance criteria of this unit of competency.

Range of Conditions

Range is restricted to essential operating conditions and any other variables essential to the work environment.

Non-essential conditions may be found in the Companion Volume Implementation Guide.

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Unit Mapping Information

This unit replaces and is equivalent to UEPOPS203B Operate and monitor communications system.

Links

Companion Volume implementation guides are found in VETNet - https://vetnet.gov.au/Pages/TrainingDocs.aspx?q=1715b9fa-e7bd-441c-bb8d-cf22c9c825a8

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Assessment Requirements for UEPOPS203 Operate and monitor communications system

Modification History

Release 1. This is the first release of this unit of competency in the UEP Generation Training Package.

Performance Evidence

Evidence required to demonstrate competence in this unit must be relevant to and satisfy all the requirements of the elements, performance criteria and range of conditions on at least two separate occasions and includes:

- applying Work, Health and Safety (WHS)/Occupational Health and Safety (OHS) requirements including:
  - emergency procedures
  - risk control measures
  - safe working practices
- communicating with personnel
- completing documentation
- monitoring communication system
- prioritising and acknowledging faulty communication
- selecting and using communications system equipment
- using interpersonal and communication system protocols and procedures
- utilising communication systems
- working with nonelectronic and electronic communication tools

Knowledge Evidence

Evidence required to demonstrate competence in this unit must be relevant to and satisfy all the requirements of the elements, performance criteria and range of conditions and includes knowledge of:

- communication systems
- interpersonal communication
- manufacturers' specifications and manuals
- use of nonelectronic and electronic communication tools
- WHS/OHS legislated requirements including:
  - emergency procedures
  - risk control procedures
  - safe working practices

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- workplace documentation
- workplace policies and procedures

Assessment Conditions

As a minimum, assessors must satisfy applicable regulatory requirements, which include requirements in the Standards for Registered Training Organisations current at the time of assessment.

As a minimum, assessment must satisfy applicable regulatory requirements, which include requirements in the Standards for Registered Training Organisations current at the time of assessment.

Assessment processes and techniques must be appropriate to the language, literacy and numeracy requirements of the work being performed and the needs of the candidate.

Assessment must occur in workplace operational situations. Where this is not appropriate, assessment must occur in simulated workplace operational situations that reflect workplace conditions.

Resources for assessment must include access to:

- a range of relevant exercises, case studies and/or other simulations
- relevant and appropriate materials, tools, equipment and personal protective equipment currently used in industry
- applicable documentation including workplace procedures, industry standards, equipment specifications, regulations, codes of practice and operation manuals.

Links

Companion Volume implementation guides are found in VETNet - https://vetnet.gov.au/Pages/TrainingDocs.aspx?q=1715b9fa-e7bd-441c-bb8d-cf22c9c825a8

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UEPOPS204 Maintain and utilise records

Modification History

Release 1. This is the first release of this unit of competency in the UEP Generation Training Package.

Application

This unit involves the skills and knowledge required to maintain and use recorded data. Power generation facility records are maintained and retrieved so that relevant data can be utilised, as required.

Recorded information can include transactions, historical data, personnel details, stakeholder information and compliance obligations. Records should provide evidence of meeting organisational and legal requirements.

Competency in this unit requires the ability to prepare and maintain records and retrieve and utilise records. Individuals will, in general, work as an operator, in a power generation facility.

No licensing, legislative or certification requirements apply to this unit at the time of publication.

Note: Workplace practice

The application of the skills and knowledge described in this unit may require a licence or training permit to practice in the workplace where work is carried out on gas and electrical installations. Additional conditions may apply under state and territory legislative and regulatory licensing requirements.

Pre-requisite Unit

There are no prerequisite units.

Competency Field

Operations

Unit Sector

Electricity generation

Elements and Performance Criteria

ELEMENTS **PERFORMANCE CRITERIA**

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Elements describe the essential outcomes.	Performance criteria describe the performance needed to demonstrate achievement of the element.
1 Maintain records	**1.1** Appropriate recording tool is selected, in accordance with workplace procedures
	1.2 Information is recorded and maintained, using document and record management system, in accordance with workplace procedures
	1.3 Recording requirements are identified and assessed, in accordance with workplace procedures
	1.4 Records are created, in accordance with workplace procedures
	1.5 Records are stored, in accordance with workplace procedures
2 Retrieve and utilise records	**2.1** Records are retrieved and utilised, in accordance with workplace procedures
	2.2 Source of information and/or records are selected, in accordance with workplace procedures
	2.3 Relevant information and/or records are selected, in accordance with workplace procedures

Foundation Skills

Foundation skills essential to performance are explicit in the performance criteria of this unit of competency.

Range of Conditions

Range is restricted to essential operating conditions and any other variables essential to the work environment.

Non-essential conditions may be found in the Companion Volume Implementation Guide.

Unit Mapping Information

This unit replaces and is equivalent to UEPOPS204B Maintain and utilise records.

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Links

Companion Volume implementation guides are found in VETNet - https://vetnet.gov.au/Pages/TrainingDocs.aspx?q=1715b9fa-e7bd-441c-bb8d-cf22c9c825a8

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Assessment Requirements for UEPOPS204 Maintain and utilise records

Modification History

Release 1. This is the first release of this unit of competency in the UEP Generation Training Package.

Performance Evidence

Evidence required to demonstrate competence in this unit must be relevant to and satisfy all the requirements of the elements, performance criteria and range of conditions on at least two separate occasions and includes:

- acquiring and analysing information relevant for recording
- applying Work, Health and Safety (WHS)/Occupational Health and Safety workplace (OHS) procedures including safety working practices
- archiving documents and records
- complying with legislation, industry standards, codes of practice and regulations
- creating, retrieving, storing and maintaining new and existing documents and records
- using a range of document and record management systems including:
  - Data Acquisition and Surveillance (DAS) systems
  - Supervisory Control and Data Acquisition (SCADA) systems
- utilising workplace procedures

Knowledge Evidence

Evidence required to demonstrate competence in this unit must be relevant to and satisfy all the requirements of the elements, performance criteria and range of conditions and includes knowledge of:

- Data Acquisition and Surveillance (DAS) systems
- legislation, industry standards, codes of practice and regulations
- Supervisory Control and Data Acquisition (SCADA) systems
- WHS/OHS legislation and regulations including safety working practices
- workplace documentation
- workplace policies and procedures

Assessment Conditions

As a minimum, assessors must satisfy applicable regulatory requirements, which include requirements in the Standards for Registered Training Organisations current at the time of assessment.

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As a minimum, assessment must satisfy applicable regulatory requirements, which include requirements in the Standards for Registered Training Organisations current at the time of assessment.

Assessment processes and techniques must be appropriate to the language, literacy and numeracy requirements of the work being performed and the needs of the candidate.

Assessment must occur in workplace operational situations. Where this is not appropriate, assessment must occur in simulated workplace operational situations that reflect workplace conditions.

Resources for assessment must include access to:

- a range of relevant exercises, case studies and/or other simulations
- relevant and appropriate materials, tools, equipment and personal protective equipment currently used in industry
- applicable documentation including workplace procedures, industry standards, equipment specifications, regulations, codes of practice and operation manuals.

Links

Companion Volume implementation guides are found in VETNet - https://vetnet.gov.au/Pages/TrainingDocs.aspx?q=1715b9fa-e7bd-441c-bb8d-cf22c9c825a8

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UEPOPS205 Conduct minor mechanical maintenance

Modification History

Release 1. This is the first release of this unit of competency in the UEP Generation Training Package.

Application

This unit involves the skills and knowledge required to conduct a range of minor maintenance functions associated with mechanical equipment. Minor is defined as work that is of lesser seriousness or significance in mechanical maintenance.

Mechanical equipment in a power generation facility can include a variety of plant, machinery and power tools that may contain computers and sensors to monitor and enhance performance.

Competency in this unit requires the ability to plan work, conduct minor maintenance and complete work. Individuals will, in general, work as an operator in a power generation facility.

Power generation plant operators are typically trained and authorised to isolate, prepare plant and issue permits to work.

No licensing, legislative or certification requirements apply to this unit at the time of publication.

Note: Workplace practice

The application of the skills and knowledge described in this unit may require a licence or training permit to practice in the workplace, where work is carried out on gas and electrical installations. Additional conditions may apply under state and territory legislative and regulatory licensing requirements.

Pre-requisite Unit

There are no prerequisite units.

Competency Field

Operations

Unit Sector

Electricity generation

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Elements and Performance Criteria

ELEMENTS	PERFORMANCE CRITERIA
Elements describe the essential outcomes.	Performance criteria describe the performance needed to demonstrate achievement of the element.
1 Plan and prepare for work	**1.1** Mechanical equipment work requirements are identified and are confirmed with appropriate personnel or by site inspection, in accordance with workplace procedures
	1.2 Work, Health and Safety (WHS)/Occupational Health and Safety (OHS) regulations, legislative requirements, industry standards, codes of practice, manufacturers' specifications, environmental obligations and workplace procedures are identified, applied and monitored
	1.3 Resources are obtained and inspected for compliance with job specification, in accordance with workplace procedures
	1.4 Plans, drawings and manuals are selected and used, in accordance with workplace procedures
	1.5 Correct size, type and quantity of materials and components are obtained and inspected, in accordance with workplace procedures for compliance with job specification
	1.6 Mechanical equipment work is sequenced and prioritised, in accordance with workplace procedures
	1.7 Potential hazards are identified and risk control measures are selected and implemented, in accordance with workplace procedures
	1.8 Work area is prepared, in accordance with workplace procedures
2 Perform minor mechanical maintenance	**2.1** Isolations are confirmed, where appropriate, in accordance with workplace procedures
	2.2 Minor mechanical equipment adjustments are performed, in accordance with workplace procedures, maintenance schedules and site requirements
	2.3 Mechanical equipment faults are reported to appropriate personnel, in accordance with workplace procedures

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3 Complete work	**3.1** Mechanical equipment work is completed and appropriate personnel are notified, in accordance with workplace procedures
	3.2 Work area is cleared of waste, cleaned, restored and secured, in accordance with workplace procedures
	3.3 Tools and equipment are maintained and stored, in accordance with workplace procedures
	3.4 Mechanical equipment work completion details are finalised, in accordance with workplace procedures

Foundation Skills

Foundation skills essential to performance are explicit in the performance criteria of this unit of competency.

Range of Conditions

Range is restricted to essential operating conditions and any other variables essential to the work environment.

Non-essential conditions may be found in the Companion Volume Implementation Guide.

Unit Mapping Information

This unit replaces and is equivalent to UEPOPS205B Conduct minor mechanical maintenance.

Links

Companion Volume implementation guides are found in VETNet - https://vetnet.gov.au/Pages/TrainingDocs.aspx?q=1715b9fa-e7bd-441c-bb8d-cf22c9c825a8

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Assessment Requirements for UEPOPS205 Conduct minor mechanical maintenance

Modification History

Release 1. This is the first release of this unit of competency in the UEP Generation Training Package.

Performance Evidence

Evidence required to demonstrate competence in this unit must be relevant to and satisfy all the requirements of the elements, performance criteria and range of conditions on at least two separate occasions and includes:

- applying Work, Health and Safety (WHS)/Occupational Health and Safety (OHS) requirements including:
  - emergency procedures
  - risk control measures
  - safe working practices
- communicating with personnel
- completing minor mechanical work
- complying with legislation, industry standards, codes of practice and regulations
- complying with maintenance schedule
- conducting minor mechanical maintenance work
- documenting records
- performing isolations
- planning and preparing for minor mechanical work
- using equipment
- utilising mechanical maintenance techniques and procedures
- working with permit to work system

Knowledge Evidence

Evidence required to demonstrate competence in this unit must be relevant to and satisfy all the requirements of the elements, performance criteria and range of conditions and includes knowledge of:

- isolations
- legislation, industry standards, codes of practice and regulations
- maintenance schedules
- manufacturers' specifications and manuals
- mechanical maintenance techniques and procedures

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- permit to work system
- record and documentation requirements
- WHS/OHS legislated requirements including:
  - emergency procedures
  - risk control measures
  - safe working practices
- workplace documentation
- workplace policies and procedures

Assessment Conditions

As a minimum, assessors must satisfy applicable regulatory requirements, which include requirements in the Standards for Registered Training Organisations current at the time of assessment.

As a minimum, assessment must satisfy applicable regulatory requirements, which include requirements in the Standards for Registered Training Organisations current at the time of assessment.

Assessment processes and techniques must be appropriate to the language, literacy and numeracy requirements of the work being performed and the needs of the candidate.

Assessment must occur in workplace operational situations. Where this is not appropriate, assessment must occur in simulated workplace operational situations that reflect workplace conditions.

Resources for assessment must include access to:

- a range of relevant exercises, case studies and/or other simulations
- relevant and appropriate materials, tools, equipment and personal protective equipment currently used in industry
- applicable documentation including workplace procedures, industry standards, equipment specifications, regulations, codes of practice and operation manuals.

Links

Companion Volume implementation guides are found in VETNet - https://vetnet.gov.au/Pages/TrainingDocs.aspx?q=1715b9fa-e7bd-441c-bb8d-cf22c9c825a8

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UEPOPS206 Conduct minor electrical maintenance

Modification History

Release 1. This is the first release of this unit of competency in the UEP Generation Training Package.

Application

This unit involves the skills and knowledge required to conduct a range of minor maintenance functions associated with electrical equipment. Minor is defined as work that is of lesser seriousness or significance in electrical maintenance.

Electrical equipment includes any machine powered by electricity used in a power generation facility. Electrical maintenance should be undertaken regularly to ensure the smooth operation of all relevant equipment.

Competency in this unit requires the ability to plan work, conduct minor electrical maintenance and the completion of work. Individuals will, in general, work as an operator in a power generation facility.

Power generation plant operators are typically trained and authorised to isolate, prepare plant and issue permits to work

No licensing, legislative or certification requirements apply to this unit at the time of publication.

Note: Workplace practice

The application of the skills and knowledge described in this unit may require a licence or training permit to practice in the workplace, where work is carried out on gas and electrical installations. Additional conditions may apply under state and territory legislative and regulatory licensing requirements.

Pre-requisite Unit

There are no prerequisite units.

Competency Field

Operations

Unit Sector

Electricity generation

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Elements and Performance Criteria

ELEMENTS	PERFORMANCE CRITERIA
Elements describe the essential outcomes.	Performance criteria describe the performance needed to demonstrate achievement of the element.
1 Plan and prepare for work	**1.1** Electrical maintenance requirements are identified from work order and are confirmed with appropriate personnel or by site inspection, in accordance with workplace procedures
	1.2 Work, Health and Safety (WHS)/Occupational Health and Safety (OHS) regulations, legislative requirements, industry standards, codes of practice, manufacturers' specifications, environmental obligations and workplace procedures are identified, applied and monitored
	1.3 Resources are obtained and inspected for compliance with job specification, in accordance with workplace procedures
	1.4 Plans, drawings and manuals are selected and used, in accordance with workplace procedures
	1.5 Correct size, type and quantity of materials and components are obtained and inspected, in accordance with workplace procedures
	1.6 Electrical maintenance work is sequenced and prioritised, in accordance with workplace procedures and site requirements
	1.7 Potential hazards are identified and risk control measures are selected and implemented, in accordance with the workplace procedures
	1.8 Work area is prepared, in accordance with workplace procedures
2 Perform minor electrical maintenance	**2.1** Isolations are confirmed, where appropriate, in accordance with workplace procedures
	2.2 Minor adjustments are performed on electrical equipment, in accordance with workplace procedures, maintenance schedule and site requirements
	2.3 Electrical maintenance faults are reported, in accordance with workplace procedures

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3 Complete work	**3.1** Electrical maintenance work is completed and appropriate personnel are notified, in accordance with workplace procedures
	3.2 Work area is cleared of waste, cleaned, restored and secured, in accordance with workplace procedures
	3.3 Tools and equipment are maintained and stored, in accordance with workplace procedures
	3.4 Electrical maintenance work completion details are finalised, in accordance with workplace procedures

Foundation Skills

Foundation skills essential to performance are explicit in the performance criteria of this unit of competency.

Range of Conditions

Range is restricted to essential operating conditions and any other variables essential to the work environment.

Non-essential conditions may be found in the Companion Volume Implementation Guide.

Unit Mapping Information

This unit replaces and is equivalent to UEPOPS206B Conduct minor electrical maintenance.

Links

Companion Volume implementation guides are found in VETNet - https://vetnet.gov.au/Pages/TrainingDocs.aspx?q=1715b9fa-e7bd-441c-bb8d-cf22c9c825a8

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Assessment Requirements for UEPOPS206 Conduct minor electrical maintenance

Modification History

Release 1. This is the first release of this unit of competency in the UEP Generation Training Package.

Performance Evidence

Evidence required to demonstrate competence in this unit must be relevant to and satisfy all the requirements of the elements, performance criteria and range of conditions on at least two separate occasions and includes:

- applying Work, Health and Safety (WHS)/Occupational Health and Safety (OHS) requirements including:
  - emergency procedures
  - risk control measures
  - safe working practices
- communicating with personnel
- completing electrical maintenance work
- complying with legislation, industry standards, codes of practice and regulations
- documenting records
- performing isolations
- planning and preparing for electrical maintenance work conducting minor electrical maintenance work
- using permit to work system
- utilising electrical maintenance techniques and procedures using equipment isolation procedures
- working to maintenance schedule

Knowledge Evidence

Evidence required to demonstrate competence in this unit must be relevant to and satisfy all the requirements of the elements, performance criteria and range of conditions and includes knowledge of:

- electrical maintenance techniques and procedures
- isolations
- legislation, industry standards, codes of practice and regulations
- maintenance schedules
- manufacturers' specifications and manuals
- permit to work system

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- record and documentation requirements
- WHS/OHS legislated requirements including:
  - emergency procedures
  - risk control measures
  - safe working practices
- workplace documentation
- workplace policies and procedures

Assessment Conditions

As a minimum, assessors must satisfy applicable regulatory requirements, which include requirements in the Standards for Registered Training Organisations current at the time of assessment.

As a minimum, assessment must satisfy applicable regulatory requirements, which include requirements in the Standards for Registered Training Organisations current at the time of assessment.

Assessment processes and techniques must be appropriate to the language, literacy and numeracy requirements of the work being performed and the needs of the candidate.

Assessment must occur in workplace operational situations. Where this is not appropriate, assessment must occur in simulated workplace operational situations that reflect workplace conditions.

Resources for assessment must include access to:

- a range of relevant exercises, case studies and/or other simulations
- relevant and appropriate materials, tools, equipment and personal protective equipment currently used in industry
- applicable documentation including workplace procedures, industry standards, equipment specifications, regulations, codes of practice and operation manuals.

Links

Companion Volume implementation guides are found in VETNet - https://vetnet.gov.au/Pages/TrainingDocs.aspx?q=1715b9fa-e7bd-441c-bb8d-cf22c9c825a8

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UEPOPS207 Perform plant lubrication

Modification History

Release 1. This is the first release of this unit of competency in the UEP Generation Training Package.

Application

This unit involves the skills and knowledge required to maintain grease, oil levels and quality in all areas of power generating plant. The selection and use of lubricants, as well as the care and operation of lubricating systems, is an essential part of any power generation plant maintenance program.

Competency in this unit requires the ability to plan and prepare plant to conduct lubrication, performing routine checks on plant, conducting plant lubrication and completing documentation. Individuals will, in general, work as an operator, in a power generation facility.

Power generation plant operators are typically trained and authorised to isolate, prepare plant and issue permits to work

No licensing, legislative or certification requirements apply to this unit at the time of publication.

Note: Workplace practice

The application of the skills and knowledge described in this unit may require a licence or training permit to practice in the workplace, where work is carried out on gas and electrical installations. Additional conditions may apply under state and territory legislative and regulatory licensing requirements.

Pre-requisite Unit

There are no prerequisite units.

Competency Field

Operations

Unit Sector

Electricity generation

Elements and Performance Criteria

ELEMENTS **PERFORMANCE CRITERIA**

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Elements describe the essential outcomes.	Performance criteria describe the performance needed to demonstrate achievement of the element.
1 Plan and prepare to conduct plant lubrication	**1.1** Work, Health and Safety (WHS)/Occupational Health and Safety (OHS) regulations are identified and applied, in accordance with workplace procedures
	1.2 Work requirements are identified, in accordance with workplace procedures, from relevant personnel and documentation
	1.3 Plant lubricating status is assessed and evaluated from documentation, in accordance with workplace procedures
	1.4 Isolation of power generation plant is arranged, in accordance with workplace procedures
	1.5 Tools, lubricants and Personal Protective Equipment (PPE) are acquired and used, in accordance with workplace procedures
2 Perform routine checks on plant lubrication	**2.1** Power generating plant is checked, in accordance with workplace procedures
	2.2 Power generating plant affected by abnormal lubrication are identified and appropriate personnel are informed, in accordance with workplace procedures
3 Conduct plant lubrication	**3.1** Power generating plant requiring lubrication are cleaned, in accordance with workplace procedures, before lubricating work is carried out
	3.2 Power generating plant is lubricated, in accordance with Safety Data Sheets (SDS)/Material Safety Data Sheets (MSDS), manufacturer specifications and workplace procedures
	3.3 Power generating plant is returned to operational condition, in accordance with workplace procedures, to ensure safety of personnel and plant integrity
4 Complete documentation	**4.1** Power generating plant problems, movements, and status is reported in accordance with workplace procedures
	4.2 Documentation is updated, in accordance with workplace procedures

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Foundation Skills

Foundation skills essential to performance are explicit in the performance criteria of this unit of competency.

Range of Conditions

Range is restricted to essential operating conditions and any other variables essential to the work environment.

Non-essential conditions may be found in the Companion Volume Implementation Guide.

Unit Mapping Information

This unit replaces and is equivalent to UEPOPS207B Perform plant lubrication.

Links

Companion Volume implementation guides are found in VETNet - https://vetnet.gov.au/Pages/TrainingDocs.aspx?q=1715b9fa-e7bd-441c-bb8d-cf22c9c825a8

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Assessment Requirements for UEPOPS207 Perform plant lubrication

Modification History

Release 1. This is the first release of this unit of competency in the UEP Generation Training Package.

Performance Evidence

Evidence required to demonstrate competence in this unit must be relevant to and satisfy all the requirements of the elements, performance criteria and range of conditions on at least two separate occasions and includes:

- applying Work, Health and Safety (WHS)/Occupational Health and Safety (OHS) regulations including:
  - emergency procedures
  - Personal Protective Equipment (PPE)
  - risk control measures
  - safe working practices
  - Safety Data Sheets (SDS)/Material Safety Data Sheets (MSDS)
- communicating with personnel
- completing documentation
- complying with permit to work requirements
- implementing hazard identification and risk control measures
- lubricating power generating plant including:
  - applying lubricants to machinery and equipment
  - conducting checks of power generating plant lubrication
  - determining problems resulting from excessive or inadequate lubricants
  - preparing and planning power generation lubricating work
- utilising isolation procedures
- working with permit to work system

Knowledge Evidence

Evidence required to demonstrate competence in this unit must be relevant to and satisfy all the requirements of the elements, performance criteria and range of conditions and includes knowledge of:

- function and types of lubricants and their application
- isolations
- lubrication of plant procedures

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- manufacturers' specifications and manuals
- permit to work system
- problems resulting from excessive or inadequate lubricants
- typical arrangement of power generation plant
- WHS/OHS legislated requirements including:
  - emergency procedures
  - Personal Protective Equipment (PPE)
  - risk control measures
  - safe working practices
  - Safety Data Sheets (SDS)/Material Safety Data Sheets (MSDS)
- workplace documentation
- workplace policies and procedures

Assessment Conditions

As a minimum, assessors must satisfy applicable regulatory requirements, which include requirements in the Standards for Registered Training Organisations current at the time of assessment.

As a minimum, assessment must satisfy applicable regulatory requirements, which include requirements in the Standards for Registered Training Organisations current at the time of assessment.

Assessment processes and techniques must be appropriate to the language, literacy and numeracy requirements of the work being performed and the needs of the candidate.

Assessment must occur in workplace operational situations. Where this is not appropriate, assessment must occur in simulated workplace operational situations that reflect workplace conditions.

Resources for assessment must include access to:

- a range of relevant exercises, case studies and/or other simulations
- relevant and appropriate materials, tools, equipment and personal protective equipment currently used in industry
- applicable documentation including workplace procedures, industry standards, equipment specifications, regulations, codes of practice and operation manuals.

Links

Companion Volume implementation guides are found in VETNet - https://vetnet.gov.au/Pages/TrainingDocs.aspx?q=1715b9fa-e7bd-441c-bb8d-cf22c9c825a8

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UEPOPS209 Perform process plant inspections

Modification History

Release 1. This is the first release of this unit of competency in the UEP Generation Training Package.

Application

This unit involves the skills and knowledge required to conduct an inspection of electric power generating plant and associated equipment.

An inspection is an organised examination of power generation plant and equipment exposed to conditions that can cause deterioration. Power generation plant and equipment should be inspected at regular intervals.

Competency in this unit requires the ability to inspect power generating plant, gain safe access to work area for inspection, conducting inspections and reporting and/or recording the results. Individuals will, in general, work under supervision, in a power generation facility as an operator.

Power generation plant operators are typically trained and authorised to isolate, prepare plant and issue permits to work.

No licensing, legislative or certification requirements apply to this unit at the time of publication.

Note: Workplace practice

The application of the skills and knowledge described in this unit may require a licence or training permit to practice in the workplace, where work is carried out on gas and electrical installations. Additional conditions may apply under state and territory legislative and regulatory licensing requirements.

Pre-requisite Unit

There are no prerequisite units.

Competency Field

Operations

Unit Sector

Electricity generation

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Elements and Performance Criteria

ELEMENTS	PERFORMANCE CRITERIA
Elements describe the essential outcomes.	Performance criteria describe the performance needed to demonstrate achievement of the element.
1 Prepare for power plant inspection	**1.1** Maintenance and operating history for inspection is obtained, in accordance with workplace procedures for process plant to be inspected
	1.2 Inspection requirements for power generation plant are determined and confirmed, in accordance with workplace procedures and Work, Health and Safety (WHS)/Occupational Health and Safety (OHS) regulations
	1.3 Appropriate inspection check lists recording equipment and personal protective equipment are obtained, in accordance with workplace procedures for process plant to be inspected
	1.4 Availability and access to power generation plant is determined, in accordance with workplace procedures and isolation processes
	1.5 Hazards are identified in preparations for plant inspection and risk control measures are implemented, in accordance with workplace procedures
2 Inspect electric power generating plant	**2.1** Power generation plant is inspected, in accordance with workplace procedures and industry standards
	2.2 Power generation plant is identified and operational status is determined, in accordance with workplace procedures
	2.3 Inspection is conducted using approved methods, in accordance with workplace procedures
	2.4 Inspection requirements are completed, in accordance with workplace procedures
3 Complete documentation	**3.1** Records are updated, in accordance with workplace procedures
	3.2 Documentation is maintained, in accordance with workplace procedures

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Foundation Skills

Foundation skills essential to performance are explicit in the performance criteria of this unit of competency.

Range of Conditions

Range is restricted to essential operating conditions and any other variables essential to the work environment.

Non-essential conditions may be found in the Companion Volume Implementation Guide.

Unit Mapping Information

This unit replaces and is equivalent to UEPOPS209B Perform process plant inspections.

Links

Companion Volume implementation guides are found in VETNet - https://vetnet.gov.au/Pages/TrainingDocs.aspx?q=1715b9fa-e7bd-441c-bb8d-cf22c9c825a8

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Assessment Requirements for UEPOPS209 Perform process plant inspections

Modification History

Release 1. This is the first release of this unit of competency in the UEP Generation Training Package.

Performance Evidence

Evidence required to demonstrate competence in this unit must be relevant to and satisfy all the requirements of the elements, performance criteria and range of conditions on at least two separate occasions and includes:

- accessing records
- applying inspection procedures and techniques
- applying Work, Health and Safety (WHS)/Occupational Health and Safety (OHS) legislation including:
  - emergency procedures
  - Personal Protective Equipment (PPE)
  - risk control measures
  - safe working practices
- complying with legislation, industry standards, codes of practice and regulations preparing for inspection of power generation plant
- conducting equipment isolation procedures
- recording and communicating inspection results
- undertaking inspection of power generation plant and equipment
- using manufacturers’ specifications and manuals
- utilising inspection checklists
- working with permit to work system

Knowledge Evidence

Evidence required to demonstrate competence in this unit must be relevant to and satisfy all the requirements of the elements, performance criteria and range of conditions and includes knowledge of:

- communication methods for inspection results
- inspection methods and techniques including protocols
- isolations
- legislation, industry standards, codes of practice and regulations
- manufacturers' specifications and manuals
- permit to work system

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- power generation inspection checklists
- power generation plant inspection records
- typical arrangements of power generation plant
- Work, Health and Safety (WHS)/Occupational Health and Safety (OHS) regulations including:
  - emergency procedures
  - Personal Protective Equipment(PPE)
  - risk control measures
  - safe working practices
- workplace policies and procedures
- workplace documentation

Assessment Conditions

As a minimum, assessors must satisfy applicable regulatory requirements, which include requirements in the Standards for Registered Training Organisations current at the time of assessment.

As a minimum, assessment must satisfy applicable regulatory requirements, which include requirements in the Standards for Registered Training Organisations current at the time of assessment.

Assessment processes and techniques must be appropriate to the language, literacy and numeracy requirements of the work being performed and the needs of the candidate.

Assessment must occur in workplace operational situations. Where this is not appropriate, assessment must occur in simulated workplace operational situations that reflect workplace conditions.

Resources for assessment must include access to:

- a range of relevant exercises, case studies and/or other simulations
- relevant and appropriate materials, tools, equipment and personal protective equipment currently used in industry
- applicable documentation including workplace procedures, industry standards, equipment specifications, regulations, codes of practice and operation manuals.

Links

Companion Volume implementation guides are found in VETNet - https://vetnet.gov.au/Pages/TrainingDocs.aspx?q=1715b9fa-e7bd-441c-bb8d-cf22c9c825a8

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UEPOPS211 Clean plant and equipment

Modification History

Release 1. This is the first release of this unit of competency in the UEP Generation Training Package.

Application

This unit involves the skills and knowledge required to clean industrial plant, machinery and surrounds associated with electricity generation stations and related surroundings. It may also include the removal of excess, or oil based, soil.

The removal of impurities is required to facilitate repairs, maintenance, refurbishment or the inspection of plant and machinery. Cleaning therefore, is often the first task performed in the maintenance, repair and overhaul of power generation plant.

Competency in this unit requires the ability to plan and prepare for the cleaning of industrial plant and equipment, conduct cleaning and complete work. Individuals will, in general, work as an operator, in a power generation facility.

Power generation plant operators are typically trained and authorised to isolate, prepare plant and issue permits to work.

No licensing, legislative or certification requirements apply to this unit at the time of publication.

Note: Workplace practice

The application of the skills and knowledge described in this unit may require a licence or training permit to practice in the workplace where work is carried out on gas and electrical installations. Additional conditions may apply under state and territory legislative and regulatory licensing requirements.

Pre-requisite Unit

There are no prerequisite units.

Competency Field

Operations

Unit Sector

Electricity generation

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Elements and Performance Criteria

ELEMENTS	PERFORMANCE CRITERIA
Elements describe the essential outcomes.	Performance criteria describe the performance needed to demonstrate achievement of the element.
1 Plan and prepare for work	**1.1** Requirements are identified from work orders and are confirmed with appropriate personnel, in accordance with workplace procedures
	1.2 Work, Health and Safety (WHS)/Occupational Health and Safety (OHS) regulations, legislative requirements, industry standards, codes of practice, manufacturers' specifications, environmental obligations and workplace procedures are identified, applied and monitored
	1.3 Resources including cleaning agents, Personal Protective Equipment (PPE) and tools are obtained and inspected for compliance with job specifications, in accordance with Safety Data Sheets (SDS)/Material Safety Data Sheets (MSDS) and workplace procedures
	1.4 Work is sequenced and prioritised, in accordance with workplace procedures
	1.5 Potential hazards are identified and prevention and risk control measures are implemented, in accordance with workplace procedures
	1.6 Work area is prepared, in accordance with workplace procedures
2 Conduct industrial plant and equipment cleaning	**2.1** Isolations are confirmed with appropriate personnel, in accordance with workplace procedures
	2.2 Surfaces are applied, where required, with suitable cleaning agent to assist in release of soil or oil residue, in accordance with manufacturer's instructions and workplace procedures
	2.3 Cleaning equipment and accessories are operated, in accordance with manufacturer's instructions and workplace procedures
	2.4 Industrial plant and equipment is cleaned, in accordance with the workplace procedures
	2.5 Residual waste is directed to suitable disposal points, in accordance with workplace procedures and

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		environmental legislation
	2.6	Final cleaning inspection is carried out, in accordance with workplace procedures
3 Complete industrial plant and equipment cleaning	**3.1**	Cleaning is completed and appropriate personnel are notified, in accordance with workplace procedures
	3.2	Work area is cleared of waste, cleaned, restored and secured, in accordance with workplace procedures
	3.3	Industrial plant, tools and equipment are maintained and stored, in accordance with workplace procedures
	3.4	Cleaning completion details are finalised, in accordance with workplace procedures

Foundation Skills

Foundation skills essential to performance are explicit in the performance criteria of this unit of competency.

Range of Conditions

Range is restricted to essential operating conditions and any other variables essential to the work environment.

Non-essential conditions may be found in the Companion Volume Implementation Guide.

Unit Mapping Information

This unit replaces and is equivalent to UEPOPS211B Clean plant and equipment.

Links

Companion Volume implementation guides are found in VETNet - https://vetnet.gov.au/Pages/TrainingDocs.aspx?q=1715b9fa-e7bd-441c-bb8d-cf22c9c825a8

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Assessment Requirements for UEPOPS211 Clean plant and equipment

Modification History

Release 1. This is the first release of this unit of competency in the UEP Generation Training Package.

Performance Evidence

Evidence required to demonstrate competence in this unit must be relevant to and satisfy all the requirements of the elements, performance criteria and range of conditions on at least two separate occasions and includes:

- applying material handling procedures
- applying Work, Health and Safety (WHS)/Occupational Health and Safety (OHS) legislated requirements including:
  - emergency procedures
  - hazard identification
  - risk control measures
  - safe working practices
  - using Personal Protective Equipment (PPE)
- communicating with personnel
- completing documentation
- complying with legislation, industry standards, codes of practice and regulations
- directing residual waste to disposal points
- handling hazardous materials
- planning cleaning work
- protecting power generation plant or equipment
- selecting appropriate cleaning methods and using cleaning techniques and procedures on industrial plant and equipment
- using manufacturers' specifications and manuals
- using Safety Data Sheets (SDS)/Material Safety Data Sheets (MSDS)
- working with isolations and permit to work system

Knowledge Evidence

Evidence required to demonstrate competence in this unit must be relevant to and satisfy all the requirements of the elements, performance criteria and range of conditions and includes knowledge of:

- cleaning equipment and accessories

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- cleaning methods
- disposal points
- hazardous materials
- isolations
- legislation, industry standards, codes of practice and regulations
- manufacturers' specifications and manuals
- material handling procedures
- permit to work system
- protection of power generation plant and equipment
- Safety Data Sheets (SDS)/material safety data sheets (MSDS)
- types of cleaning agents, their properties and application
- WHS/OHS regulations including:
  - emergency procedures
  - hazard identification
  - Personal Protective Equipment (PPE)
  - risk control measures
  - safe working practices
- workplace documentation
- workplace policies and procedures

Assessment Conditions

As a minimum, assessors must satisfy applicable regulatory requirements, which include requirements in the Standards for Registered Training Organisations current at the time of assessment.

As a minimum, assessment must satisfy applicable regulatory requirements, which include requirements in the Standards for Registered Training Organisations current at the time of assessment.

Assessment processes and techniques must be appropriate to the language, literacy and numeracy requirements of the work being performed and the needs of the candidate.

Assessment must occur in workplace operational situations. Where this is not appropriate, assessment must occur in simulated workplace operational situations that reflect workplace conditions.

Resources for assessment must include access to:

- a range of relevant exercises, case studies and/or other simulations
- relevant and appropriate materials, tools, equipment and personal protective equipment currently used in industry
- applicable documentation including workplace procedures, industry standards, equipment specifications, regulations, codes of practice and operation manuals.

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Links

Companion Volume implementation guides are found in VETNet - https://vetnet.gov.au/Pages/TrainingDocs.aspx?q=1715b9fa-e7bd-441c-bb8d-cf22c9c825a8

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UEPOPS232 Transport plant and equipment

Modification History

Release 1. This is the first release of this unit of competency in the UEP Generation Training Package.

Application

This unit involves the skills and knowledge required to transport power generation plant and equipment.

Road transport is typically used to move light or heavy materials, equipment and power generation plant from one location to another, as required.

Competency in this unit requires the ability to plan and prepare for power generation plant and equipment for transportation, obtaining permits, loading and unloading power generation plant and equipment, securing load, operating transport vehicle and completing documentation. Individuals will, in general, work as an operator, in a power generation facility.

No licensing, legislative or certification requirements apply to this unit at the time of publication.

Note: Workplace practice

The application of the skills and knowledge described in this unit may require a licence or training permit to practice in the workplace where work is carried out on gas and electrical installations, or driving transport vehicles. Additional conditions may apply under state and territory legislative and regulatory licensing requirements.

Pre-requisite Unit

There are no prerequisite units.

Competency Field

Operations

Unit Sector

Electricity generation

Elements and Performance Criteria

ELEMENTS **PERFORMANCE CRITERIA**

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Elements describe the essential outcomes.	Performance criteria describe the performance needed to demonstrate achievement of the element.
1 Plan and prepare for transportation	**1.1** Safety requirements are identified, in accordance with Work, Health and Safety (WHS)/Occupational Health and Safety (OHS) regulations, legislative requirements, industry standards, codes of practice and workplace procedures
	1.2 Transport requirements are confirmed from work scheduling, in accordance with workplace procedures
	1.3 Characteristics of load are identified, in accordance with workplace procedures, to ensure appropriate loading and unloading procedures are followed
2 Obtain transport permits	**2.1** Permit forms are completed, in accordance with workplace procedures
	2.2 Load is assessed so as not to exceed safe working capacity of vehicle, in accordance with workplace procedures, manufacturers' specifications and regulatory authority's requirements
3 Load/unload plant or equipment	**3.1** Vehicle is inspected prior to loading, in accordance with workplace procedures and manufacturers' specifications
	3.2 Start up, park up and shut down procedures are carried out on transport vehicle, as required, in accordance with manufacturers' specifications and workplace procedures
	3.3 Power generation plant and equipment is loaded and unloaded safely, in accordance with workplace procedures, ensuring no injury to personnel or damage to property, equipment and load
	3.4 Calculations on dimensions including height and width of load and transport vehicle requirements are made for oversized loads, in accordance with workplace procedures
	3.5 Lashings are stored in transport vehicle, in accordance with workplace procedures
	3.6 Load is secured to transport vehicle using appropriate securing equipment and is lashed to anchorage points, in accordance with securing systems, manufacturers' specifications and workplace procedures

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4 Operate transport vehicle	**4.1**	Preoperational checks are carried out on power generation plant, in accordance with manufacturers' recommendations and workplace procedures
	4.2	Attachments are set at correct height or position, and transport vehicle is driven, in accordance with traffic regulations, manufacturers' specifications and workplace procedures
	4.3	Start up, park up and shut down procedures are carried out on transport vehicle, in accordance with manufacturers' recommendations and workplace
	4.4	Hazards are identified and risk control measures are applied whilst transporting power generation plant and equipment on public roads and at work site, in accordance with workplace procedures
	4.5	Traffic regulations are adhered to, in accordance with workplace procedures
5 Complete documentation	**5.1**	Post operational checks and minor maintenance is carried out on transport vehicle and accessories, in accordance with manufacturers' recommendations and workplace procedures
	5.2	Documentation is updated and transport vehicle abnormalities and status is reported, in accordance with workplace

Foundation Skills

Foundation skills essential to performance are explicit in the performance criteria of this unit of competency.

Range of Conditions

Range is restricted to essential operating conditions and any other variables essential to the work environment.

Non-essential conditions may be found in the Companion Volume Implementation Guide.

Unit Mapping Information

This unit replaces and is equivalent to UEPOPS232B Transport plant and equipment.

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Links

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Assessment Requirements for UEPOPS232 Transport plant and equipment

Modification History

Release 1. This is the first release of this unit of competency in the UEP Generation Training Package.

Performance Evidence

Evidence required to demonstrate competence in this unit must be relevant to and satisfy all the requirements of the elements, performance criteria and range of conditions on at least two separate occasions and includes:

- applying Work, Health and Safety (WHS)/Occupational Health and Safety (OHS) legislated requirements including:
  - emergency procedures
  - risk control measures
  - safe working practices
- completing documentation using recording procedures
- complying with legislation, industry standards, codes of practice and regulations
- complying with road transport permit requirements
- loading, offloading and transporting power generation plant and equipment
- operating and manoeuvring vehicles
- operational and maintenance procedures
- prestart, start up and shut down procedures
- securing loads using lashing techniques

Knowledge Evidence

Evidence required to demonstrate competence in this unit must be relevant to and satisfy all the requirements of the elements, performance criteria and range of conditions and includes knowledge of:

- lashing techniques
- legislation, industry standards, codes of practice and regulations
- loading and offloading procedures
- manufacturers' specifications and manuals
- power generation plant and equipment, its location and operation
- prestart, start up and shut down procedures
- road transport permits
- transport equipment capabilities and limitations

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- transport operational and maintenance procedures
- WHS/OHS legislated requirements including:
  - emergency procedures
  - risk control measures
  - safe working practices
- workplace policies and procedures
- workplace documentation

Assessment Conditions

As a minimum, assessors must satisfy applicable regulatory requirements, which include requirements in the Standards for Registered Training Organisations current at the time of assessment.

As a minimum, assessment must satisfy applicable regulatory requirements, which include requirements in the Standards for Registered Training Organisations current at the time of assessment.

Assessment processes and techniques must be appropriate to the language, literacy and numeracy requirements of the work being performed and the needs of the candidate.

Assessment must occur in workplace operational situations. Where this is not appropriate, assessment must occur in simulated workplace operational situations that reflect workplace conditions.

Resources for assessment must include access to:

- a range of relevant exercises, case studies and/or other simulations
- relevant and appropriate materials, tools, equipment and personal protective equipment currently used in industry
- applicable documentation including workplace procedures, industry standards, equipment specifications, regulations, codes of practice and operation manuals.

Links

Companion Volume implementation guides are found in VETNet - https://vetnet.gov.au/Pages/TrainingDocs.aspx?q=1715b9fa-e7bd-441c-bb8d-cf22c9c825a8

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UEPOPS237 Perform tool store duties

Modification History

Release 1. This is the first release of this unit of competency in the UEP Generation Training Package.

Application

This unit involves the skills and knowledge required to perform operational processes in the storage of tools and consumable items that are used in a power generation facility.

Tool store operations revolve around monitoring and controlling the flow of tools and consumable items into and out of a power generation facility. It includes oversight of tool store operations; maintaining inventory; receiving, storing, and issuing tools, materials, equipment and other items; updating records and compiling store reports.

Competency in this unit requires the ability to plan and prepare for tool store duties, issuing and maintaining tools and associated equipment and completing tool store work. Individuals will, in general, work as an operator, in a power generation facility.

No licensing, legislative or certification requirements apply to this unit at the time of publication.

Note: Workplace practice

The application of the skills and knowledge described in this unit may require a licence or training permit to practice in the workplace where work is carried out on gas and electrical installations. Additional conditions may apply under state and territory legislative and regulatory licensing requirements.

Pre-requisite Unit

There are no prerequisite units.

Competency Field

Operations

Unit Sector

Electricity generation

Elements and Performance Criteria

ELEMENTS **PERFORMANCE CRITERIA**

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Elements describe the essential outcomes.	Performance criteria describe the performance needed to demonstrate achievement of the element.
1 Plan and prepare for tool store duties	**1.1** Tooling requirements are identified from documentation and are confirmed with appropriate personnel, in accordance with workplace procedures
	1.2 Work, Health and Safety (WHS)/Occupational Health and Safety (OHS) regulations, legislative requirements, industry standards, codes of practice, manufacturers' specifications, environmental obligations and workplace procedures are identified, applied and monitored
	1.3 Tools and equipment audit is conducted and recorded to identify type, quantity and location, in accordance with workplace procedures
	1.4 Appropriate tooling requirements are identified from supplier catalogues and manuals and are ordered, in accordance with workplace procedures
2 Issue and maintain tools and associated equipment	**2.1** Tooling orders received are checked for compliance and stored, in accordance with workplace procedures
	2.2 Tools and associated equipment are issued, in accordance with workplace procedures
	2.3 Tools and associated equipment are inspected to ensure safe operation, and defects are noted and repairs are instigated, in accordance with workplace procedures
	2.4 Tools and associated equipment are maintained, in accordance with workplace procedures
	2.5 Stock levels are maintained and replacement parts or items are ordered, in accordance with workplace procedures
3 Complete tool store duties	**3.1** Tool store inventory is maintained, in accordance with workplace procedures
	3.2 Tool store area is cleared and secured, in accordance with workplace procedures

Foundation Skills

Foundation skills essential to performance are explicit in the performance criteria of this unit of competency.

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Range of Conditions

Range is restricted to essential operating conditions and any other variables essential to the work environment.

Non-essential conditions may be found in the Companion Volume Implementation Guide.

Unit Mapping Information

This unit replaces and is equivalent to UEPOPS237B Perform tool store duties

Links

Companion Volume implementation guides are found in VETNet - https://vetnet.gov.au/Pages/TrainingDocs.aspx?q=1715b9fa-e7bd-441c-bb8d-cf22c9c825a8

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Assessment Requirements for UEPOPS237 Perform tool store duties

Modification History

Release 1. This is the first release of this unit of competency in the UEP Generation Training Package.

Performance Evidence

Evidence required to demonstrate competence in this unit must be relevant to and satisfy all the requirements of the elements, performance criteria and range of conditions on at least two separate occasions and includes:

- applying legislation, industry standards, codes of practice and regulations
- communicating with personnel
- completing tool store duties
- interpreting manufacturers' specifications and manuals
- issuing and maintaining tools, consumable items and associated equipment
- maintaining tool stores documentation and records
- preparing and planning tool store work
- using tool ordering procedures
- Work, Health and Safety (WHS)/Occupational Health and Safety (OHS) regulations including:
  - emergency procedures
  - risk control measures
  - safe working practices

Knowledge Evidence

Evidence required to demonstrate competence in this unit must be relevant to and satisfy all the requirements of the elements, performance criteria and range of conditions and includes knowledge of:

- consumable items and tool storage
- documenting and reporting tool store inventory
- legislation, industry standards, codes of practice and regulations
- maintenance requirements
- ordering and maintaining tool store procedures
- tool attachments and accessories
- tool names, types and their uses
- WHS/OHS requirements including:

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  - emergency procedures
  - risk control measures
  - safe working practices
- workplace policies and procedures
- workplace documentation

Assessment Conditions

As a minimum, assessors must satisfy applicable regulatory requirements, which include requirements in the Standards for Registered Training Organisations current at the time of assessment.

As a minimum, assessment must satisfy applicable regulatory requirements, which include requirements in the Standards for Registered Training Organisations current at the time of assessment.

Assessment processes and techniques must be appropriate to the language, literacy and numeracy requirements of the work being performed and the needs of the candidate.

Assessment must occur in workplace operational situations. Where this is not appropriate, assessment must occur in simulated workplace operational situations that reflect workplace conditions.

Resources for assessment must include access to:

- a range of relevant exercises, case studies and/or other simulations
- relevant and appropriate materials, tools, equipment and personal protective equipment currently used in industry
- applicable documentation including workplace procedures, industry standards, equipment specifications, regulations, codes of practice and operation manuals.

Links

Companion Volume implementation guides are found in VETNet - https://vetnet.gov.au/Pages/TrainingDocs.aspx?q=1715b9fa-e7bd-441c-bb8d-cf22c9c825a8

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UEPOPS238 Maintain battery banks and cells

Modification History

Release 1. This is the first release of this unit of competency in the UEP Generation Training Package.

Application

This unit involves the skills and knowledge required to undertake the maintenance of all battery cells or banks.

Batteries store energy so that it can be used when needed, batteries can be charged, discharged and recharged several times. The types of equipment supported by batteries in a power generation facility can include emergency lighting systems and alarm and protection systems.

Competency in this unit requires the ability to plan and prepare for battery cell/bank maintenance work, conduct tests on battery cell/bank, analyse results of tests to determine its capability, perform routine maintenance, report abnormalities and documenting work when completed. Individuals will, in general, work as an operator, in a power generation facility.

Power generation plant operators are typically trained and authorised to isolate, prepare plant and issue permits to work.

No licensing, legislative or certification requirements apply to this unit at the time of publication.

Note: Workplace practice

The application of the skills and knowledge described in this unit may require a licence or training permit to practice in the workplace where work is carried out on gas and electrical installations. Additional conditions may apply under state and territory legislative and regulatory licensing requirements.

Pre-requisite Unit

There are no prerequisite units.

Competency Field

Operations

Unit Sector

Electricity generation

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Elements and Performance Criteria

ELEMENTS	PERFORMANCE CRITERIA
Elements describe the essential outcomes.	Performance criteria describe the performance needed to demonstrate achievement of the element.
1 Plan and prepare for work	**1.1** Requirements are identified from work order and is confirmed with appropriate personnel and/or by site inspection, in accordance with workplace procedures
	1.2 Work, Health and Safety (WHS)/Occupational Health and Safety (OHS)regulations, legislative requirements, industry standards, codes of practice, manufacturers' specifications, environmental obligations and workplace procedures are identified, applied and monitored
	1.3 Resources are obtained and inspected for compliance with job specification, in accordance with workplace procedures
	1.4 Relevant plans, drawings and manuals are selected and used, in accordance with workplace procedures
	1.5 Correct size, type and quantity of materials and/or components are obtained and inspected, in accordance with workplace procedures
	1.6 Work is sequenced and prioritised, in accordance with workplace procedures and site requirements
	1.7 Potential hazards and risk control measures are selected and implemented, in accordance with workplace procedures and Material Safety Data Sheets (MSDS) processes
	1.8 Work area is prepared, in accordance with workplace procedures
2 Conduct tests on battery cell/bank	**2.1** Battery cell and/or bank is inspected prior to testing to ensure absence of any damage or defects, in accordance with workplace procedures
	2.2 Tests are carried out to determine battery cell or bank condition, in accordance with workplace procedures
	2.3 Test results are recorded and analysed to determine battery cell and/or bank capabilities, in accordance with workplace procedures

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	2.4	Testing and measurement instruments are used, in accordance with manufacturers' specifications and workplace procedures
	2.5	Faults found are documented and reported to appropriate personnel, in accordance with workplace procedures
3 Conduct maintenance on battery cell/bank	**3.1**	Isolations are confirmed, where appropriate, in accordance with workplace procedures
	3.2	Battery cell and/or bank is maintained using plans, drawings and manuals in accordance with workplace procedures
	3.3	Cleaning or adjustments are carried out on battery cell and/or bank, in accordance with workplace procedures
	3.4	Maintenance and adjustments are carried out, in accordance with workplace procedures
	3.5	Final inspection is carried out, in accordance with workplace procedures.
4 Complete work	**4.1**	Battery cell and/or bank work is completed and relevant personnel are notified, in accordance with workplace procedures
	4.2	Work area is cleared of waste, cleaned, restored and secured, in accordance with workplace procedures
	4.3	Battery cell and/or bank tools and equipment are maintained and stored, in accordance with workplace procedures

Foundation Skills

Foundation skills essential to performance are explicit in the performance criteria of this unit of competency.

Range of Conditions

Range is restricted to essential operating conditions and any other variables essential to the work environment.

Non-essential conditions may be found in the Companion Volume Implementation Guide.

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Unit Mapping Information

This unit replaces and is equivalent to UEPOPS238B Maintain battery banks and cells.

Links

Companion Volume implementation guides are found in VETNet - https://vetnet.gov.au/Pages/TrainingDocs.aspx?q=1715b9fa-e7bd-441c-bb8d-cf22c9c825a8

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Assessment Requirements for UEPOPS238 Maintain battery banks and cells

Modification History

Release 1. This is the first release of this unit of competency in the UEP Generation Training Package.

Performance Evidence

Evidence required to demonstrate competence in this unit must be relevant to and satisfy all the requirements of the elements, performance criteria and range of conditions on at least two separate occasions and includes:

- applying maintenance techniques to repair faults
- applying Work, Health and Safety (WHS)/Occupational Health and Safety (OHS) regulations including:
  - emergency procedures
  - risk control measures
  - safe working procedures
- communicating with personnel
- complying legislation, industry standards, codes of practice and regulations
- interpreting drawings and manufacturers' specifications' and manuals
- maintaining battery cell and/or bank equipment
- reporting findings
- selecting equipment and material
- testing battery cell or bank using diagnostic and data analysis techniques
- using Safety Data Sheets (SDS)/Material Safety Data Sheets (MSDS)
- using testing and measurement instruments to identify faults and abnormalities
- utilising permit to work system
- working with isolation procedures

Knowledge Evidence

Evidence required to demonstrate competence in this unit must be relevant to and satisfy all the requirements of the elements, performance criteria and range of conditions and includes knowledge of:

- battery cell or bank testing and maintenance procedures
- battery plant operation
- isolations
- maintenance techniques

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- manufacturers' specifications and manuals
- permit to work system
- safety and hazard precautions
- Safety Data Sheets (SDS)/Material Safety Data Sheets (MSDS)
- testing and fault finding techniques
- workplace documentation
- WHS/OHS legislated requirements including:
  - applying isolation procedures
  - emergency procedures
  - risk control measures
  - safe working procedures
- workplace policies and procedures

Assessment Conditions

As a minimum, assessors must satisfy applicable regulatory requirements, which include requirements in the Standards for Registered Training Organisations current at the time of assessment.

As a minimum, assessment must satisfy applicable regulatory requirements, which include requirements in the Standards for Registered Training Organisations current at the time of assessment.

Assessment processes and techniques must be appropriate to the language, literacy and numeracy requirements of the work being performed and the needs of the candidate.

Assessment must occur in workplace operational situations. Where this is not appropriate, assessment must occur in simulated workplace operational situations that reflect workplace conditions.

Resources for assessment must include access to:

- a range of relevant exercises, case studies and/or other simulations
- relevant and appropriate materials, tools, equipment and personal protective equipment currently used in industry
- applicable documentation including workplace procedures, industry standards, equipment specifications, regulations, codes of practice and operation manuals.

Links

Companion Volume implementation guides are found in VETNet - https://vetnet.gov.au/Pages/TrainingDocs.aspx?q=1715b9fa-e7bd-441c-bb8d-cf22c9c825a8

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UEPOPS240 Operate and monitor fuel supply (coal)

Modification History

Release 1. This is the first release of this unit of competency in the UEP Generation Training Package.

Application

This unit involves the skills and knowledge required to operate, inspect and monitor coal delivery systems to power generating unit storage bunkers.

A power generating facility that burns fossil fuels is reliant on fuel supply delivery systems to maintain power generation capability. A coal delivery system will consist of plant and/or equipment that requires regular monitoring to ensure smooth operations are maintained.

Competency in this unit requires the ability to plan work, operate coal delivery system plant, analyse coal delivery system plant faults, monitor and inspect coal delivery system plant and completion of all documentation. Individuals will, in general, work under supervision, in a power generation facility as an operator.

Power generation plant operators are typically trained and authorised to isolate, prepare plant and issue permits to work.

No licensing, legislative or certification requirements apply to this unit at the time of publication.

Note: Workplace practice

The application of the skills and knowledge described in this unit may require a licence or training permit to practice in the workplace where work is carried out on gas and electrical installations. Additional conditions may apply under state and territory legislative and regulatory licensing requirements.

Pre-requisite Unit

There are no prerequisite units.

Competency Field

Operations

Unit Sector

Electricity generation

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Elements and Performance Criteria

ELEMENTS	PERFORMANCE CRITERIA
Elements describe the essential outcomes.	Performance criteria describe the performance needed to demonstrate achievement of the element.
1 Plan and prepare fuel delivery plant for operation	**1.1** Safety issues related to operating and monitoring fuel delivery system plant are identified, in accordance with workplace procedures, and Work, Health and Safety (WHS)/Occupational Health and Safety (OHS) regulations and legislative requirements
	1.2 Work, fuel delivery plant and resource requirements are identified, in accordance with workplace procedures, from appropriate personnel and documentation
	1.3 Quality assurance requirements are identified, in accordance with workplace procedures
	1.4 Documentation to determine fuel delivery plant status is assessed and evaluated, in accordance with workplace procedures
	1.5 Inspection and field preparation for fuel delivery plant service is carried out, in accordance with workplace procedures and manufacturers' recommendations
	1.6 Operational prerequisites for fuel delivery plant is established, in accordance with workplace procedures and manufacturers' recommendations
	1.7 Sequence for recommissioning of fuel delivery plant is determined, in accordance with workplace procedures and site requirements
2 Operate coal delivery plant	**2.1** Fuel delivery plant is operated, in accordance with workplace procedures and manufacturers' operating recommendations
	2.2 Fuel delivery plant is monitored and observed, in accordance with workplace procedures, to detect deviations from normal operating conditions
	2.3 Corrective action is taken, in accordance with workplace procedures, when fuel delivery plant response does not meet documentation, plant integrity or personnel safety requirements

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	2.4	Fuel delivery plant is returned to operational status upon completion of testing, in accordance with workplace procedures
3 Analyse fuel delivery plant faults	**3.1**	Causes of abnormal fuel delivery plant operating conditions are identified, in accordance with workplace procedures, by analysing technical and operational information
	3.2	Corrective action is taken, in accordance with workplace procedures
4 Monitor and inspect fuel delivery plant	**4.1**	Fuel delivery plant to be monitored and inspected is physically identified, in accordance with workplace procedures
	4.2	Fuel delivery plant is monitored and inspected for normal operation or to detect deviations, in accordance with workplace procedures
	4.3	Corrective action is taken, in accordance with workplace procedures
	4.4	Appropriate personnel are notified when defects are detected, in accordance with workplace procedures
5 Complete documentation	**5.1**	Fuel delivery plant problems, movements and status is reported, in accordance with workplace procedures
	5.2	Documentation is updated, in accordance with workplace procedures

Foundation Skills

Foundation skills essential to performance are explicit in the performance criteria of this unit of competency.

Range of Conditions

Range is restricted to essential operating conditions and any other variables essential to the work environment.

Non-essential conditions may be found in the Companion Volume Implementation Guide.

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Unit Mapping Information

This unit replaces and is equivalent to UEPOPS240B Operate and monitor fuel supply (coal).

Links

Companion Volume implementation guides are found in VETNet - https://vetnet.gov.au/Pages/TrainingDocs.aspx?q=1715b9fa-e7bd-441c-bb8d-cf22c9c825a8

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Assessment Requirements for UEPOPS240 Operate and monitor fuel supply (coal)

Modification History

Release 1. This is the first release of this unit of competency in the UEP Generation Training Package.

Performance Evidence

Evidence required to demonstrate competence in this unit must be relevant to and satisfy all the requirements of the elements, performance criteria and range of conditions on at least two separate occasions and includes:

- analysing fuel supply delivery system plant faults using data analysis techniques and tools
- applying Work, Health and Safety (WHS)/Occupational Health and Safety (OHS) requirements including:
  - emergency procedures
  - risk control measures
- safe working practices
- communicating with personnel
- complying with legislation, industry standards, codes of practice and regulations
- identifying fuel supply delivery system plant status
- interpreting manufacturers' specifications and manuals
- operating, monitoring and inspecting fuel supply delivery system plant operations
- preparing and planning work including applying operational procedures
- recognising and responding to abnormal fuel supply delivery system plant operating conditions
- testing fuel supply delivery system plant operationally using diagnostic and test techniques
- working with permit to work system

Knowledge Evidence

Evidence required to demonstrate competence in this unit must be relevant to and satisfy all the requirements of the elements, performance criteria and range of conditions and includes knowledge of:

- fuel supply delivery system plant and equipment, its location and operating parameters
- fuel supply delivery system plant status
- legislation, industry standards, codes of practice and regulations
- manufacturers' specifications and manuals
- operation and inspection of fuel supply delivery system plant operations
- typical arrangements of power production plant

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- WHS/OHS legislated requirements including:
  - emergency procedures
  - risk control measures
  - safe working practices
- workplace documentation
- workplace policies and procedures permit to work system

Assessment Conditions

As a minimum, assessors must satisfy applicable regulatory requirements, which include requirements in the Standards for Registered Training Organisations current at the time of assessment.

As a minimum, assessment must satisfy applicable regulatory requirements, which include requirements in the Standards for Registered Training Organisations current at the time of assessment.

Assessment processes and techniques must be appropriate to the language, literacy and numeracy requirements of the work being performed and the needs of the candidate.

Assessment must occur in workplace operational situations. Where this is not appropriate, assessment must occur in simulated workplace operational situations that reflect workplace conditions. Resources for assessment must include access to:

- a range of relevant exercises, case studies and/or other simulations
- relevant and appropriate materials, tools, equipment and personal protective equipment currently used in industry
- applicable documentation including workplace procedures, industry standards, equipment specifications, regulations, codes of practice and operation manuals.

Links

Companion Volume implementation guides are found in VETNet - https://vetnet.gov.au/Pages/TrainingDocs.aspx?q=1715b9fa-e7bd-441c-bb8d-cf22c9c825a8

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UEPOPS241 Operate and monitor ash and dust disposal plant

Modification History

Release 1. This is the first release of this unit of competency in the UEP Generation Training Package.

Application

This unit involves the skills and knowledge required to operate, inspect and monitor ash and dust disposal plant associated with a coal fired power station.

Power generation facilities produce waste that must either be removed, recycled or stored. Ash and dust, produced from coal power generation must be disposed of using an established ash and dust handling system.

Competency in this unit requires the ability to plan work, operate ash and dust disposal plant, test ash and dust disposal plant operation, respond to abnormal ash and dust disposal plant operation, monitor and inspect ash and dust disposal plant and complete all documentation. Individuals will, in general, work under supervision, in a power generation facility as an operator.

Power generation plant operators are typically trained and authorised to isolate, prepare plant and issue permits to work.

No licensing, legislative or certification requirements apply to this unit at the time of publication.

Note: Workplace practice

The application of the skills and knowledge described in this unit may require a licence or training permit to practice in the workplace where work is carried out on gas and electrical installations. Additional conditions may apply under state and territory legislative and regulatory licensing requirements.

Pre-requisite Unit

There are no prerequisite units.

Competency Field

Operations

Unit Sector

Electricity generation

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Elements and Performance Criteria

ELEMENTS	PERFORMANCE CRITERIA
Elements describe the essential outcomes.	Performance criteria describe the performance needed to demonstrate achievement of the element.
1 Plan and prepare disposal plant for operation	**1.1** Safety issues relating to operating and monitoring an ash and dust disposal system are identified, in accordance with workplace procedures and Work, Health and Safety (WHS)/Occupational Health and Safety (OHS) regulations and legislative requirements
	1.2 Work requirements are identified, in accordance with workplace procedures, from relevant personnel and documentation
	1.3 Inspection and field preparation for service of ash and dust disposal system is carried out, in accordance with workplace procedures and manufacturers' recommendations
	1.4 Ash and dust disposal plant operational prerequisites are established, in accordance with workplace procedures and manufacturers' recommendations
	1.5 Sequence for recommissioning of ash and dust disposal plant is determined, in accordance with workplace procedures and site requirements
2 Operate disposal plant	**2.1** Ash and dust disposal plant is operated, in accordance with workplace procedures and manufacturers' operating recommendations
	2.2 Ash and dust disposal plant is monitored and observed, in accordance with workplace procedures, to detect deviations from normal operating conditions
	2.3 Corrective action is taken, to rectify abnormalities, in accordance with workplace procedures, industry standards and site requirements
3 Test disposal plant operation	**3.1** Operational tests are performed, in accordance with workplace procedures
	3.2 Ash and dust disposal plant is observed for correct operational response, in accordance with workplace procedures

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	3.3	Corrective action is taken, in accordance with workplace procedures, when ash and dust disposal plant response does not meet documentation, plant integrity or personnel safety requirements
	3.4	Ash and dust disposal plant is returned to operational status upon completion of testing, in accordance with workplace procedures
4 Respond to abnormal disposal plant operation	**4.1**	Causes of abnormal plant ash and dust disposal plant operating conditions are identified, in accordance with workplace procedures, by analysing technical and operational information
	4.2	Corrective action is taken, in accordance with workplace procedures
	4.3	Ash and dust disposal plant integrity and personnel safety is maintained, in accordance with workplace procedures and in consultation with appropriate personnel and technical and operational documentation
5 Monitor and inspect disposal plant	**5.1**	Ash and dust disposal plant to be monitored and inspected is physically identified, in accordance with workplace procedures
	5.2	Ash and dust disposal plant is monitored and inspected for normal operation or to detect deviations, in accordance with workplace procedures
	5.3	Corrective action is taken, in accordance with workplace procedures
	5.4	Appropriate personnel are notified when defects are detected, in accordance with workplace procedures
6 Complete documentation	**6.1**	Ash and dust disposal plant problems, abnormalities and status are reported, in accordance with workplace procedures
	6.2	Documentation is updated, in accordance with workplace procedures

Foundation Skills

Foundation skills essential to performance are explicit in the performance criteria of this unit of competency.

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Range of Conditions

Range is restricted to essential operating conditions and any other variables essential to the work environment.

Non-essential conditions may be found in the Companion Volume Implementation Guide.

Unit Mapping Information

This unit replaces and is equivalent to UEPOPS241B Operate and monitor ash and dust disposal plant.

Links

Companion Volume implementation guides are found in VETNet - https://vetnet.gov.au/Pages/TrainingDocs.aspx?q=1715b9fa-e7bd-441c-bb8d-cf22c9c825a8

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Assessment Requirements for UEPOPS241 Operate and monitor ash and dust disposal plant

Modification History

Release 1. This is the first release of this unit of competency in the UEP Generation Training Package.

Performance Evidence

Evidence required to demonstrate competence in this unit must be relevant to and satisfy all the requirements of the elements, performance criteria and range of conditions on at least two separate occasions and includes:

- analysing ash and dust disposal plant faults using data analysis techniques and tools
- applying Work, Health and Safety (WHS)/Occupational Health and Safety (OHS) requirements including:
  - emergency procedures
  - risk control measures
  - safety practices procedures
- communicating with personnel
- completing documentation using recording procedures
- complying with legislation, industry standards, codes of practice and regulations
- interpreting manufacturers' specifications and manuals
- monitoring and inspecting ash and dust disposal plant operations
- operating ash and dust disposal plant
- organising resources
- preparing and planning work
- recognising and responding to abnormal ash and dust disposal plant operating conditions
- testing ash and dust disposal plant operationally using diagnostic and test techniques
- working with permit to work system

Knowledge Evidence

Evidence required to demonstrate competence in this unit must be relevant to and satisfy all the requirements of the elements, performance criteria and range of conditions and includes knowledge of:

- ash and dust disposal plant and equipment, its location and operating parameters
- ash and dust disposal plant status
- legislation, industry standards, codes of practice and regulations typical arrangements of power production plant including ash and dust removal systems
- manufacturers' specifications and manuals

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- permit to work system
- types and characteristics of ash formations, bottom ash and fly ash
- WHS/OHS legislated requirements including:
  - emergency procedures
  - risk control measures
  - safe working practices
- workplace documentation
- workplace policies and procedures including recording procedures

Assessment Conditions

As a minimum, assessors must satisfy applicable regulatory requirements, which include requirements in the Standards for Registered Training Organisations current at the time of assessment.

As a minimum, assessment must satisfy applicable regulatory requirements, which include requirements in the Standards for Registered Training Organisations current at the time of assessment.

Assessment processes and techniques must be appropriate to the language, literacy and numeracy requirements of the work being performed and the needs of the candidate.

Assessment must occur in workplace operational situations. Where this is not appropriate, assessment must occur in simulated workplace operational situations that reflect workplace conditions.

Resources for assessment must include access to:

- a range of relevant exercises, case studies and/or other simulations
- relevant and appropriate materials, tools, equipment and personal protective equipment currently used in industry
- applicable documentation including workplace procedures, industry standards, equipment specifications, regulations, codes of practice and operation manuals.

Links

Companion Volume implementation guides are found in VETNet - https://vetnet.gov.au/Pages/TrainingDocs.aspx?q=1715b9fa-e7bd-441c-bb8d-cf22c9c825a8

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UEPOPS242 Operate and monitor dust collection plant

Modification History

Release 1. This is the first release of this unit of competency in the UEP Generation Training Package.

Application

This unit involves the skills and knowledge required to operate, inspect and monitor dust collection plant associated with a power station.

Power generation facilities will produce waste that must either be removed, recycled or stored. Dust produced from the generation of power must be disposed of using an established dust handling system.

Competency in this unit requires the ability to plan work, operate dust disposal plant, test dust disposal plant operation, respond to abnormal dust disposal plant operations, monitor and inspect dust disposal plant and complete all documentation. Individuals will, in general, work under supervision, in a power generation facility as an operator.

Power generation plant operators are typically trained and authorised to isolate, prepare plant and issue permits to work.

No licensing, legislative or certification requirements apply to this unit at the time of publication.

Note: Workplace practice

The application of the skills and knowledge described in this unit may require a licence or training permit to practice in the workplace where work is carried out on gas and electrical installations. Additional conditions may apply under state and territory legislative and regulatory licensing requirements.

Pre-requisite Unit

There are no prerequisite units.

Competency Field

Operations

Unit Sector

Electricity generation

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Elements and Performance Criteria

ELEMENTS	PERFORMANCE CRITERIA
Elements describe the essential outcomes.	Performance criteria describe the performance needed to demonstrate achievement of the element.
1 Plan and prepare work	**1.1** Safety issues relating to operating and monitoring dust collection plant are identified, in accordance with workplace procedures, and Work, Health and Safety (WHS)/Occupational Health and Safety (OHS) regulations and legislative requirements
	1.2 Work requirements are identified, in accordance with workplace procedures, from relevant personnel and documentation
	1.3 Inspection and field preparation for dust collection plant service is carried out, in accordance with workplace procedures and manufacturers' recommendations
	1.4 Dust collection plant operational prerequisites are established, in accordance with workplace procedures and manufacturers' recommendations
	1.5 Sequence for recommissioning of dust collection plant is determined, in accordance with workplace procedures and site requirements
2 Operate dust collection plant	**2.1** Dust collection plant is operated, in accordance with workplace procedures and manufacturers' operating recommendations
	2.2 Dust collection plant is monitored and observed, in accordance with workplace procedures, to detect deviations from normal operating conditions
	2.3 Corrective action is taken to rectify abnormalities, in accordance with workplace procedures, industry standards and site requirements
3 Test dust collection plant operation	**3.1** Operational tests are performed, in accordance with workplace procedures
	3.2 Dust collection plant is observed for correct operational response, in accordance with workplace procedures
	3.3 Corrective action is taken, in accordance with workplace procedures, when dust collection plant response does not meet documentation, plant integrity or personnel safety

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		requirements
	3.4	Dust collection plant is returned to required operational status upon completion of testing, in accordance workplace procedures
4 Analyse dust collection plant faults	**4.1**	Causes of abnormal dust collection plant operating conditions are identified, in accordance with workplace procedures and by analysing technical and operational information
	4.2	Corrective action is taken, in accordance with workplace procedures
	4.3	Dust collection plant integrity and personnel safety is maintained, in accordance with workplace procedures, and in consultation with appropriate personnel and technical and operational documentation
5 Monitor and inspect dust collection plant	**5.1**	Dust collection plant to be monitored or inspected is physically identified, in accordance with workplace procedures
	5.2	Dust collection plant is monitored or inspected for normal operation or to detect deviations, in accordance with workplace procedures
	5.3	Corrective action is taken, in accordance with workplace procedures
	5.4	Appropriate personnel are notified when defects are detected, in accordance with workplace procedures
6 Complete documentation	**6.1**	Dust collection plant problems, movements, abnormalities and status are reported, in accordance with workplace procedures
	6.2	Documentation is updated, in accordance with workplace procedures

Foundation Skills

Foundation skills essential to performance are explicit in the performance criteria of this unit of competency.

Range of Conditions

Range is restricted to essential operating conditions and any other variables essential to the work

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environment.

Non-essential conditions may be found in the Companion Volume Implementation Guide.

Unit Mapping Information

This unit replaces and is equivalent to UEPOPS242B Operate and monitor dust collection plant.

Links

Companion Volume implementation guides are found in VETNet - https://vetnet.gov.au/Pages/TrainingDocs.aspx?q=1715b9fa-e7bd-441c-bb8d-cf22c9c825a8

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Assessment Requirements for UEPOPS242 Operate and monitor dust collection plant

Modification History

Evidence required to demonstrate competence in this unit must be relevant to and satisfy all the requirements of the elements, performance criteria and range of conditions on at least two separate occasions and includes:

- analysing dust collection plant faults using data analysis techniques and tools
- applying Work, Health and Safety (WHS)/Occupational Health and Safety (OHS) requirements including:
  - emergency procedures
  - risk control measures
  - safe working practices
- communicating with personnel
- completing documentation using recording procedures
- complying with legislation, industry standards, codes of practice and regulations
- identifying and responding to abnormal dust collection plant operating conditions
- interpreting manufacturers' specifications and manuals
- monitoring and inspecting dust collection plant operations
- operating dust collection dust collection plant
- organising resources
- preparing and planning work
- preparing dust collection plant and equipment for operation
- recognising and identifying dust collection plant status
- testing dust collection plant operationally using diagnostic and test techniques
- working with permit to work system

Performance Evidence

Evidence required to demonstrate competence in this unit must be relevant to and satisfy all the requirements of the elements, performance criteria and range of conditions and includes knowledge of:

- dust collection plant and equipment, its location and operating parameters
- dust collection plant status
- legislation, industry standards, codes of practice and regulations
- manufacturers' specifications and manuals
- permit to work system
- safe operating principles
- typical arrangements of power production plant
- WHS/OHS legislated requirements including:

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  - emergency procedures
  - risk control measures
  - safe working practices
- workplace documentation
- workplace policies and procedures

Knowledge Evidence

As a minimum, assessors must satisfy applicable regulatory requirements, which include requirements in the Standards for Registered Training Organisations current at the time of assessment.

As a minimum, assessment must satisfy applicable regulatory requirements, which include requirements in the Standards for Registered Training Organisations current at the time of assessment.

Assessment processes and techniques must be appropriate to the language, literacy and numeracy requirements of the work being performed and the needs of the candidate.

Assessment must occur in workplace operational situations. Where this is not appropriate, assessment must occur in simulated workplace operational situations that reflect workplace conditions. Resources for assessment must include access to:

- a range of relevant exercises, case studies and/or other simulations
- relevant and appropriate materials, tools, equipment and personal protective equipment currently used in industry
- applicable documentation including workplace procedures, industry standards, equipment specifications, regulations, codes of practice and operation manuals.

Assessment Conditions

UEP Training Package Companion Volume Implementation Guide at: [sector webpage link here]

Links

Companion Volume implementation guides are found in VETNet - https://vetnet.gov.au/Pages/TrainingDocs.aspx?q=1715b9fa-e7bd-441c-bb8d-cf22c9c825a8

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UEPOPS243 Operate air conditioning plant

Modification History

Release 1. This is the first release of this unit of competency in the UEP Generation Training Package.

Application

This unit involves the skills and knowledge required to operate and inspect all air conditioning plant.

Air conditioning in power generation facilities refers to systems that cool air and remove humidity from areas filled with heat producing plant and equipment. A complete system of heating, ventilation, and air conditioning is referred to as Heating, Ventilation and Air Conditioning (HVAC).

Competency in this unit requires the ability to plan and prepare work; operate, test, analyse and report on air conditioning plant and complete all documentation. Individuals will, in general, work under supervision, in a power generation facility as an operator.

Power generation plant operators are typically trained and authorised to isolate, prepare plant and issue permits to work.

No licensing, legislative or certification requirements apply to this unit at the time of publication.

Note: Workplace practice

The application of the skills and knowledge described in this unit may require a licence or training permit to practice in the workplace where work is carried out on gas and electrical installations. Additional conditions may apply under state and territory legislative and regulatory licensing requirements.

Pre-requisite Unit

There are no prerequisite units.

Competency Field

Operations

Unit Sector

Electricity generation

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Elements and Performance Criteria

ELEMENTS	PERFORMANCE CRITERIA
Elements describe the essential outcomes.	Performance criteria describe the performance needed to demonstrate achievement of the element.
1 Plan and prepare work	**1.1** Safety issues are identified, in accordance with Work, Health and Safety (WHS)/Occupational Health and Safety (OHS) regulations, environmental legislation, industry standards and workplace procedures
	1.2 Work requirements are identified from relevant personnel and documentation, in accordance with workplace procedures
	1.3 Documentation to determine air conditioning plant status is assessed and evaluated, in accordance with workplace procedures
	1.4 Inspection for service is carried out, in accordance with workplace procedures and site operational requirements
	1.5 Air conditioning plant operational prerequisites are established, in accordance with manufacturers' recommendations and workplace procedures
	1.6 Sequence for recommissioning of air conditioning plant is determined, in accordance with workplace procedures
2 Conduct operation of air conditioning plant	**2.1** Air conditioning plant is operated, in accordance with workplace procedures and manufacturers' operating recommendations
	2.2 Air conditioning plant is monitored and observed, in accordance with workplace procedures, to detect deviations from normal operating conditions
	2.3 Corrective actions are taken to rectify air conditioning plant abnormalities, in accordance with workplace procedures
	2.4 Air conditioning plant to be removed from service is identified and removed, in accordance with workplace procedures
	2.5 Corrective actions are taken, in accordance with workplace procedures, safety rules and site requirements, when abnormalities are identified during

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		removal of air conditioning plant from service
3 Test plant operation	**3.1**	Tests are performed on air conditioning plant, in accordance with workplace procedures
	3.2	Air conditioning plant is observed, in accordance with workplace procedures, for correct operational response
	3.3	Corrective action is taken, in accordance with workplace procedures
	3.4	Air conditioning plant is returned to required operational status upon completion of testing, in accordance with workplace procedures
4 Analyse plant faults	**4.1**	Causes of abnormal air conditioning plant operating conditions are identified by analysing technical and operational information, in accordance with workplace procedures
	4.2	Corrective action is taken, in accordance with workplace procedures
	4.3	Air conditioning plant integrity and personnel safety is maintained, in accordance with workplace procedures, through consultation with appropriate personnel and technical and operational documentation
5 Monitor and inspect plant	**5.1**	Air conditioning plant to be monitored or inspected is physically identified, in accordance with workplace procedures
	5.2	Air conditioning plant is monitored or inspected, in accordance with workplace procedures, for normal operation or to detect deviations
	5.3	Corrective action is taken, in accordance with workplace procedures
	5.4	Appropriate personnel are notified, in accordance with workplace procedures, when defects are detected
6 Complete documentation	**6.1**	Air conditioning plant problems, movements and status are reported, in accordance with workplace procedures
	6.2	Documentation is updated, in accordance with workplace procedures

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Foundation Skills

Foundation skills essential to performance are explicit in the performance criteria of this unit of competency.

Range of Conditions

Range is restricted to essential operating conditions and any other variables essential to the work environment.

Non-essential conditions may be found in the Companion Volume Implementation Guide.

Unit Mapping Information

This unit replaces and is equivalent to UEPOPS243B Operate air conditioning plant.

Links

Companion Volume implementation guides are found in VETNet - https://vetnet.gov.au/Pages/TrainingDocs.aspx?q=1715b9fa-e7bd-441c-bb8d-cf22c9c825a8

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Assessment Requirements for UEPOPS243 Operate air conditioning plant

Modification History

Release 1. This is the first release of this unit of competency in the UEP Generation Training Package.

Performance Evidence

Evidence required to demonstrate competence in this unit must be relevant to and satisfy all the requirements of the elements, performance criteria and range of conditions on at least two separate occasions and includes:

- applying Work, Health and Safety (WHS)/Occupational Health and Safety (OHS) regulations including:
  - emergency procedures
  - risk control measures
  - safe working practices
- communicating with personnel
- complying with legislation, industry standards, codes of practice and regulations
- operating air conditioning plant including:
  - applying permit to work system
  - completing documentation
  - interpreting technical drawings and manufacturers' specifications and manuals
  - monitoring and inspecting air conditioning plant
  - planning air conditioning work
  - reporting on air conditioning plant status
  - testing air conditioning plant using diagnostic and data analysis techniques
  - using manufactures' specifications and manuals
  - utilising measuring and testing instruments to identify faults and abnormalities

Knowledge Evidence

Evidence required to demonstrate competence in this unit must be relevant to and satisfy all the requirements of the elements, performance criteria and range of conditions and includes knowledge of:

- air conditioning plant and equipment, its location and operating parameters
- air conditioning plant operations
- legislation, industry standards, codes of practice and regulations
- manufacturers' specifications and manuals

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- permit to work system
- safety and hazard precautions associated with air conditioning plant
- test and fault finding techniques
- typical arrangements of power production plant
- WHS/OHS legislated regulations including:
  - risk control measures
  - safe working practices
  - emergency procedures
- workplace documentation
- workplace policies and procedures

Assessment Conditions

As a minimum, assessors must satisfy applicable regulatory requirements, which include requirements in the Standards for Registered Training Organisations current at the time of assessment.

As a minimum, assessment must satisfy applicable regulatory requirements, which include requirements in the Standards for Registered Training Organisations current at the time of assessment.

Assessment processes and techniques must be appropriate to the language, literacy and numeracy requirements of the work being performed and the needs of the candidate.

Assessment must occur in workplace operational situations. Where this is not appropriate, assessment must occur in simulated workplace operational situations that reflect workplace conditions.

Resources for assessment must include access to:

- a range of relevant exercises, case studies and/or other simulations
- relevant and appropriate materials, tools, equipment and personal protective equipment currently used in industry
- applicable documentation including workplace procedures, industry standards, equipment specifications, regulations, codes of practice and operation manuals.

Links

Companion Volume implementation guides are found in VETNet - https://vetnet.gov.au/Pages/TrainingDocs.aspx?q=1715b9fa-e7bd-441c-bb8d-cf22c9c825a8

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UEPOPS244 Operate and monitor site services water systems

Modification History

Release 1. This is the first release of this unit of competency in the UEP Generation Training Package.

Application

This unit involves the skills and knowledge required to operate, inspect and monitor a power generation facility's site services water system, excluding fixed fire water services.

Water systems are an essential component in power generating facility operations. The smooth operation of a power generating facility's water system must be maintained and optimised to ensure safety and the mitigation of potential impacts from dangerous situations.

Competency in this unit requires the ability to plan work, operate water system plant, test water system plant operation, respond to abnormal water system plant operation, monitor and inspect water system plant and the completion of all documentation. Individuals will, in general, work under supervision, in a power generation facility as an operator.

Power generation plant operators are typically trained and authorised to isolate, prepare plant and issue permits to work.

No licensing, legislative or certification requirements apply to this unit at the time of publication.

Note: Workplace practice

The application of the skills and knowledge described in this unit may require a licence or training permit to practice in the workplace where work is carried out on gas and electrical installations. Additional conditions may apply under state and territory legislative and regulatory licensing requirements.

Pre-requisite Unit

There are no prerequisite units.

Competency Field

Operations

Unit Sector

Electricity generation

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Elements and Performance Criteria

ELEMENTS	PERFORMANCE CRITERIA
Elements describe the essential outcomes.	Performance criteria describe the performance needed to demonstrate achievement of the element.
1 Plan and prepare work	**1.1** Safety issues relating to operating and monitoring water system plant are identified, in accordance with workplace procedures and Work, Health and Safety (WHS)/Occupational Health and Safety (OHS) regulations and legislative requirements
	1.2 Work requirements are identified from appropriate personnel and documentation, in accordance with workplace procedures
	1.3 Documentation to determine water system plant status is assessed and evaluated, in accordance with workplace procedures
	1.4 Inspection and field preparations of water system plant service is carried out, in accordance with workplace procedures and manufacturers' recommendations
	1.5 Water system plant operational prerequisites are established, in accordance with workplace procedures and manufacturers' recommendations
	1.6 Sequence for recommissioning of water system plant is determined, in accordance with workplace procedures and site requirements
2 Operate water system plant	**2.1** Water system plant is operated, in accordance with workplace procedures and manufacturers' operating recommendations
	2.2 Water system plant is monitored and observed, in accordance with workplace procedures, to detect deviations from normal operating conditions
	2.3 Corrective actions are taken to rectify abnormalities, in accordance with workplace procedures and manufacturers' recommendations
3 Test water system plant operation	**3.1** Operational tests are performed, in accordance with workplace procedures
	3.2 Water system plant is observed for correct operational

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		response, in accordance with workplace procedures
	3.3	Corrective action is taken, in accordance with workplace procedures, when water system response does not meet documentation, plant integrity or personnel safety requirements
	3.4	Water system plant is returned to operational status upon completion of testing, in accordance with workplace procedures
4 Analyse water system plant faults	**4.1**	Causes of abnormal water system plant operating conditions are identified, in accordance workplace procedures, and by analysing technical and operational information
	4.2	Corrective action is taken, in accordance with workplace procedures
	4.3	Water system plant integrity and personnel safety are maintained, in accordance with workplace procedures, and in consultation with appropriate personnel and technical and operational documentation
5 Monitor and inspect water system plant	**5.1**	Water system plant to be monitored and/or inspected is physically identified, in accordance with workplace procedures
	5.2	Water system plant is monitored and/or inspected for normal operation or to detect deviations, in accordance with workplace procedures
	5.3	Corrective action is taken, in accordance with workplace procedures
	5.4	Appropriate personnel are notified when defects are detected, in accordance with workplace procedures
6 Complete documentation	**6.1**	Water system plant problems, movements and status are reported, in accordance with workplace procedures
	6.2	Documentation is updated, in accordance with workplace procedures

Foundation Skills

Foundation skills essential to performance are explicit in the performance criteria of this unit of competency.

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Range of Conditions

Range is restricted to essential operating conditions and any other variables essential to the work environment.

Non-essential conditions may be found in the Companion Volume Implementation Guide.

Unit Mapping Information

This unit replaces and is equivalent to UEPOPS244B Operate and monitor site services water systems.

Links

Companion Volume implementation guides are found in VETNet - https://vetnet.gov.au/Pages/TrainingDocs.aspx?q=1715b9fa-e7bd-441c-bb8d-cf22c9c825a8

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Assessment Requirements for UEPOPS244 Operate and monitor site services water systems

Modification History

Release 1. This is the first release of this unit of competency in the UEP Generation Training Package.

Performance Evidence

Evidence required to demonstrate competence in this unit must be relevant to and satisfy all the requirements of the elements, performance criteria and range of conditions on at least two separate occasions and includes:

- analysing water system plant faults using analysis techniques and tools
- applying Work, Health and Safety (WHS)/Occupational Health and Safety (OHS) requirements including:
  - emergency procedures
  - risk control measures
  - safe working practices
- communicating with personnel
- completing documentation using recording procedures
- complying with legislation, industry standards, codes of practice and regulations
- identifying water system plant status
- interpreting manufacturers' specifications and manuals
- monitoring and inspecting water system plant operations
- operating water system plant
- organising resources
- preparing and planning work
- preparing plant and equipment for operation
- recognising and responding to abnormal water system plant operating conditions
- testing water system plant operationally using diagnostic and test techniques
- working with permit to work system

Knowledge Evidence

Evidence required to demonstrate competence in this unit must be relevant to and satisfy all the requirements of the elements, performance criteria and range of conditions and includes knowledge of:

- inspection and monitoring plant water system
- legislation, industry standards, codes of practice and regulations

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- manufacturers' manuals and specifications
- permit to work system
- safe operating principles
- water system plant and equipment, its location and operating parameters
- water system plant status including the identification of faults and abnormalities
- WHS/OHS legislated requirements including:
  - emergency procedures
  - risk control measures
  - safe working practices
- workplace documentation
- workplace policies and procedures

Assessment Conditions

As a minimum, assessors must satisfy applicable regulatory requirements, which include requirements in the Standards for Registered Training Organisations current at the time of assessment.

As a minimum, assessment must satisfy applicable regulatory requirements, which include requirements in the Standards for Registered Training Organisations current at the time of assessment.

Assessment processes and techniques must be appropriate to the language, literacy and numeracy requirements of the work being performed and the needs of the candidate.

Assessment must occur in workplace operational situations. Where this is not appropriate, assessment must occur in simulated workplace operational situations that reflect workplace conditions. Resources for assessment must include access to:

- a range of relevant exercises, case studies and/or other simulations
- relevant and appropriate materials, tools, equipment and personal protective equipment currently used in industry
- applicable documentation including workplace procedures, industry standards, equipment specifications, regulations, codes of practice and operation manuals.

Links

Companion Volume implementation guides are found in VETNet - https://vetnet.gov.au/Pages/TrainingDocs.aspx?q=1715b9fa-e7bd-441c-bb8d-cf22c9c825a8

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UEPOPS245 Conduct chemical batching operations

Modification History

Release 1. This is the first release of this unit of competency in the UEP Generation Training Package.

Application

This unit involves the skills and knowledge required to conduct mixing of chemicals for the treatment of a primary substance.

A chemical that is needed in the workplace in a small amount (i.e. a speciality chemical) is usually made through using a batching process. Considerable care with all compounds and substances must be undertaken when conducting chemical batching operations due to toxicity.

Competency in this unit requires the ability to plan work, perform chemical batching and the completion of work. Individuals will, in general, work as an operator in a power generation facility.

No licensing, legislative or certification requirements apply to this unit at the time of publication.

Note: Workplace practice

The application of the skills and knowledge described in this unit may require a licence or training permit to practice in the workplace where work is carried out on gas and electrical installations. Additional conditions may apply under state and territory legislative and regulatory licensing requirements.

Pre-requisite Unit

There are no prerequisite units.

Competency Field

Operations

Unit Sector

Electricity generation

Elements and Performance Criteria

ELEMENTS **PERFORMANCE CRITERIA**

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Elements describe the essential outcomes.	Performance criteria describe the performance needed to demonstrate achievement of the element.
1 Plan and prepare work	**1.1** Work requirements are identified and confirmed with appropriate personnel, in accordance with workplace procedures
	1.2 Work, Health and Safety (WHS)/Occupational Health and Safety (OHS) regulations, legislative requirements, industry standards, codes of practice, manufacturers' specifications, environmental obligations and workplace procedures are identified, applied and monitored
	1.3 Potential hazards are identified and risk control measures are selected, in accordance with workplace procedures
	1.4 Resources, including Material Data Safety Sheet (MSDS) and Personal Protective Equipment (PPE), are inspected and used, in accordance with workplace procedures
2 Perform chemical batching	**2.1** Staff are notified on commencement and completion of chemical batching work, in accordance with workplace procedures
	2.2 Chemical requirements for batching is calculated, in accordance with workplace procedures and job requirement
	2.3 Correct chemical is added to tank or chemical batching plant, in accordance with workplace procedures
	2.4 Demineralised water is added to chemical batch to correct level, in accordance with workplace procedures
	2.5 Mixing device is operated, in accordance with workplace procedures
	2.6 Work site is left clean and safe, in accordance with workplace procedures to ensure personnel safety and power generating plant integrity
3 Complete documentation	**3.1** Chemical batching problems are reported, in accordance with workplace procedures
	3.2 Documentation is updated, in accordance with workplace procedures

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Foundation Skills

Foundation skills essential to performance are explicit in the performance criteria of this unit of competency.

Range of Conditions

Range is restricted to essential operating conditions and any other variables essential to the work environment.

Non-essential conditions may be found in the Companion Volume Implementation Guide.

Unit Mapping Information

This unit replaces and is equivalent to UEPOPS245B Conduct chemical batching operations.

Links

Companion Volume implementation guides are found in VETNet - https://vetnet.gov.au/Pages/TrainingDocs.aspx?q=1715b9fa-e7bd-441c-bb8d-cf22c9c825a8

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Assessment Requirements for UEPOPS245 Conduct chemical batching operations

Modification History

Release 1. This is the first release of this unit of competency in the UEP Generation Training Package.

Performance Evidence

Evidence required to demonstrate competence in this unit must be relevant to and satisfy all the requirements of the elements, performance criteria and range of conditions on at least two separate occasions and includes:

- applying Work, Health and Safety (WHS)/Occupational Health and Safety (OHS) requirements including:
  - emergency procedures
  - Personal Protective Equipment (PPE)
  - risk control measures
  - safe working practices
- communicating with personnel
- completing documentation using recording procedures
- complying with legislation, industry standards, codes of practice and regulations
- conducting chemical batching operations
- identifying power generating plant status using diagnostic and testing techniques
- organising resources
- performing chemical batching
- planning and preparing work
- preparing chemical batching plant and/or equipment for operation
- safely handling hazardous materials
- using risk mitigation processes such Safety Data Sheets (SDS)/Material Data Safety Sheets (MSDS)

Knowledge Evidence

Evidence required to demonstrate competence in this unit must be relevant to and satisfy all the requirements of the elements, performance criteria and range of conditions and includes knowledge of:

- chemical batching operations
- chemicals, uses and hazards
- legislation, industry standards, codes of practice and regulations
- manufacturers' specifications and manuals

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- power generating plant and equipment, its location and operating parameters
- power generating plant status
- risk mitigation processes including Safety Data Sheets (SDS)/Material Data Safety Sheets (MSDS)
- safe handling of hazardous materials
- types of chemicals, properties and precautions to be taken
- typical arrangements of power production plant
- WHS/OHS legislated requirements including:
  - emergency procedures
  - risk control measures
  - safe working practices including Personal Protective Equipment (PPE)
- workplace documentation
- workplace policies and procedures

Assessment Conditions

As a minimum, assessors must satisfy applicable regulatory requirements, which include requirements in the Standards for Registered Training Organisations current at the time of assessment.

As a minimum, assessment must satisfy applicable regulatory requirements, which include requirements in the Standards for Registered Training Organisations current at the time of assessment.

Assessment processes and techniques must be appropriate to the language, literacy and numeracy requirements of the work being performed and the needs of the candidate.

Assessment must occur in workplace operational situations. Where this is not appropriate, assessment must occur in simulated workplace operational situations that reflect workplace conditions.

Resources for assessment must include access to:

- a range of relevant exercises, case studies and/or other simulations
- relevant and appropriate materials, tools, equipment and personal protective equipment currently used in industry
- applicable documentation including workplace procedures, industry standards, equipment specifications, regulations, codes of practice and operation manuals.

Links

Companion Volume implementation guides are found in VETNet - https://vetnet.gov.au/Pages/TrainingDocs.aspx?q=1715b9fa-e7bd-441c-bb8d-cf22c9c825a8

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UEPOPS246 Operate waste and contaminated water plant

Modification History

Release 1. This is the first release of this unit of competency in the UEP Generation Training Package.

Application

This unit involves the skills and knowledge required to operate, inspect and monitor waste and contaminated water plant associated with a power generating facility.

Wastewater treatment covers the mechanisms and processes used to treat wastewater that is produced as a by-product of power generation activities. Wastewater from generating plants can contain significant levels of metals, flue-gas desulfurization, fly ash, bottom ash and flue gas mercury. After treatment, the treated wastewater can be either reused or released.

Competency in this unit requires the ability to plan and prepare waste and contaminated water plant; operate, test, analyse and inspect plant; report on abnormalities and complete documentation. Individuals will, in general, work under supervision, in a power generation facility as an operator.

Power generation plant operators are typically trained and authorised to isolate, prepare plant and issue permits to work.

No licensing, legislative or certification requirements apply to this unit at the time of publication.

Note: Workplace practice

The application of the skills and knowledge described in this unit may require a licence or training permit to practice in the workplace where work is carried out on gas and electrical installations. Additional conditions may apply under state and territory legislative and regulatory licensing requirements.

Pre-requisite Unit

There are no prerequisite units.

Competency Field

Operations

Unit Sector

Electricity generation

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Elements and Performance Criteria

ELEMENTS	PERFORMANCE CRITERIA
Elements describe the essential outcomes.	Performance criteria describe the performance needed to demonstrate achievement of the element.
1 Plan and prepare waste and contaminated water plant work	**1.1** Safety issues are identified, in accordance with Work, Health and Safety (WHS)/Occupational Health and Safety (OHS) regulations, legislative requirements, industry standards and workplace procedures
	1.2 Work requirements are identified from relevant personnel and documentation, in accordance with workplace procedures
	1.3 Documentation to determine waste and contaminated water plant status is assessed and evaluated, in accordance with workplace procedures
	1.4 Inspection for waste and contaminated water plant service are carried out, in accordance with manufacturers' specifications and workplace procedures
	1.5 Waste and contaminated water plant operational prerequisites are established, in accordance with manufacturers' specifications and workplace procedures
	1.6 Sequence for recommissioning of waste and contaminated water plant is determined, in accordance with workplace procedures and site requirements
2 Conduct operation of waste and contaminated water plant	**2.1** Waste and contaminated water plant is operated, in accordance with manufacturers' specifications and workplace procedures
	2.2 Waste and contaminated water plant is monitored and observed, in accordance with workplace procedures, to detect deviations from normal operating conditions
	2.3 Corrective actions are taken to rectify waste and contaminated water abnormalities, in accordance with manufacturers' specifications and workplace procedures
	2.4 Waste and contaminated water plant is removed from service, in accordance with workplace procedures and site requirements
3 Test waste and contaminated water plant	**3.1** Tests are performed, in accordance with WHS/OHS and environmental statutory requirements, industry

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	operation		standards, manufacturers' specifications and workplace procedures
		3.2	Waste and contaminated water plant is observed for correct operational response, in accordance with workplace procedures and legislative requirements
		3.3	Corrective action is taken, in accordance with workplace procedures, when response does not meet documentation, plant integrity or personnel safety requirements
		3.4	Waste and contaminated water plant is returned to required operational status upon completion of testing in accordance with workplace procedures and legislative requirements
4	**Analyse waste and contaminated water plant faults**	**4.1**	Causes of abnormal waste and contaminated water plant operating conditions are identified, in accordance with workplace procedures, by analysing technical and operational information
		4.2	Corrective action is taken, in accordance with workplace procedures
		4.3	Waste and contaminated water plant integrity and personnel safety is maintained, in accordance with workplace procedures, through consultation with appropriate personnel and technical and operational documentation
5	**Monitor and inspect waste and contaminated water plant**	**5.1**	Waste and contaminated water plant to be monitored and inspected is identified, in accordance with workplace procedures
		5.2	Waste and contaminated water plant is monitored and inspected, in accordance with workplace procedures, for normal operation or to detect deviations
		5.3	Corrective action is taken, in accordance with workplace procedures
		5.4	Appropriate personnel are notified, in accordance with workplace procedures, when defects are detected
6	**Complete documentation**	**6.1**	Waste and contaminated water plant problems, movements and status are reported in accordance with workplace procedures

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6.2 Documentation is updated, in accordance with workplace procedures

Foundation Skills

Foundation skills essential to performance are explicit in the performance criteria of this unit of competency.

Range of Conditions

Range is restricted to essential operating conditions and any other variables essential to the work environment.

Non-essential conditions may be found in the Companion Volume Implementation Guide.

Unit Mapping Information

This unit replaces and is equivalent to UEPOPS246B Operate waste and contaminated water plant.

Links

Companion Volume implementation guides are found in VETNet - https://vetnet.gov.au/Pages/TrainingDocs.aspx?q=1715b9fa-e7bd-441c-bb8d-cf22c9c825a8

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Assessment Requirements for UEPOPS246 Operate waste and contaminated water plant

Modification History

Release 1. This is the first release of this unit of competency in the UEP Generation Training Package.

Performance Evidence

Evidence required to demonstrate competence in this unit must be relevant to and satisfy all the requirements of the elements, performance criteria and range of conditions on at least two separate occasions and includes:

- applying Work, Health and Safety (WHS)/Occupational Health and Safety (OHS) regulations including:
  - emergency procedures
  - risk control measures
  - safe working practices
- communicating with personnel
- completing documentation
- complying with legislation, industry standards, codes of practice and regulations
- identifying and responding to abnormal waste and contaminated water plant operating conditions
- interpreting drawings and manufacturers' specifications and manuals
- monitoring and inspecting waste and contaminated water plant
- operating waste contaminated water plant
- organising resources
- planning work
- preparing waste and contaminated water plant or equipment for operation
- reporting on waste and contaminated water plant status
- testing waste and contaminated water plant using diagnostic and data analysis techniques
- using testing and measurement instruments to identify faults and abnormalities
- working with permit to work system

Knowledge Evidence

Evidence required to demonstrate competence in this unit must be relevant to and satisfy all the requirements of the elements, performance criteria and range of conditions and includes knowledge of:

- legislation, industry standards, codes of practice and regulations
- manufacturers' manuals and specifications

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- permit to work system
- testing and fault finding techniques
- typical arrangements of power production plant
- waste and contaminated water plant and equipment, its location and operating parameters
- WHS/OHS regulations including:
  - emergency procedures
  - risk control measures
  - safe working practices
- workplace documentation
- workplace policies and procedures

Assessment Conditions

As a minimum, assessors must satisfy applicable regulatory requirements, which include requirements in the Standards for Registered Training Organisations current at the time of assessment.

As a minimum, assessment must satisfy applicable regulatory requirements, which include requirements in the Standards for Registered Training Organisations current at the time of assessment.

Assessment processes and techniques must be appropriate to the language, literacy and numeracy requirements of the work being performed and the needs of the candidate.

Assessment must occur in workplace operational situations. Where this is not appropriate, assessment must occur in simulated workplace operational situations that reflect workplace conditions.

Resources for assessment must include access to:

- a range of relevant exercises, case studies and/or other simulations
- relevant and appropriate materials, tools, equipment and personal protective equipment currently used in industry
- applicable documentation including workplace procedures, industry standards, equipment specifications, regulations, codes of practice and operation manuals.

Links

Companion Volume implementation guides are found in VETNet - https://vetnet.gov.au/Pages/TrainingDocs.aspx?q=1715b9fa-e7bd-441c-bb8d-cf22c9c825a8

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UEPOPS247 Operate and monitor an internal combustion single fuel reciprocating engine

Modification History

Release 1. This is the first release of this unit of competency in the UEP Generation Training Package.

Application

This unit involves the skills and knowledge required to operate, inspect and monitor single fuel internal combustion reciprocating engines.

Typically, an internal combustion engine uses fossil fuels such as petrol, gas, diesel or oil. Internal combustion reciprocating engines in the form of combustion turbines drive the largest electric generators.

Competency in this unit requires the ability to plan work, operate internal combustion single fuel reciprocating engine plant, test internal combustion single fuel reciprocating engine plant operations, analyse internal combustion single fuel reciprocating engine plant faults, monitor and inspect internal combustion single fuel reciprocating engine plant and the completion of all documentation. Individuals will, in general, work under supervision, in a power generating facility as an operator.

Power generation plant operators are typically trained and authorised to isolate, prepare plant and issue permits to work.

No licensing, legislative or certification requirements apply to this unit at the time of publication.

Note: Workplace practice

The application of the skills and knowledge described in this unit may require a licence or training permit to practice in the workplace where work is carried out on gas and electrical installations. Additional conditions may apply under state and territory legislative and regulatory licensing requirements.

Pre-requisite Unit

There are no prerequisite units.

Competency Field

Operations

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Unit Sector

Electricity generation

Elements and Performance Criteria

ELEMENTS	PERFORMANCE CRITERIA
Elements describe the essential outcomes.	Performance criteria describe the performance needed to demonstrate achievement of the element.
1 Plan and prepare work	**1.1** Safety issues related to operating and monitoring internal combustion single fuel reciprocating engines are identified, in accordance with workplace procedures and Work, Health and Safety (WHS)/Occupational Health and Safety (OHS) regulations and legislative requirements
	1.2 Work requirements are identified, in accordance with workplace procedures, from relevant personnel and documentation
	1.3 Documentation to determine single fuel reciprocating engine plant status is assessed and evaluated, in accordance with workplace procedures
	1.4 Inspection and field preparation for single fuel reciprocating engine plant service is carried out, in accordance with workplace procedures and manufacturers' recommendations
	1.5 Single fuel reciprocating engine plant operational prerequisites are established, in accordance with workplace procedures and manufacturers' recommendations
	1.6 Sequence for recommissioning of single fuel reciprocating engine plant is determined to suit existing circumstances, in accordance with workplace procedures and site requirements
2 Operate single fuel reciprocating engine plant	**2.1** Single fuel reciprocating engine plant is operated, in accordance with workplace procedures and manufacturers' operating recommendations
	2.2 Single fuel reciprocating engine plant is monitored and observed to detect deviations from normal operating conditions, in accordance with workplace procedures

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	2.3	Corrective actions are taken to rectify abnormalities, in accordance with workplace procedures and manufacturers' recommendations
3 Test single fuel reciprocating engine plant operation	**3.1**	Operational tests are performed, in accordance with workplace procedures
	3.2	Single fuel reciprocating engine plant is observed for correct operational response, in accordance with workplace procedures
	3.3	Corrective action is taken, in accordance with workplace procedures, when response does not meet with documentation, plant integrity or personnel safety requirements
	3.4	Appropriate personnel are notified, in accordance with workplace procedures, when defects are detected
4 Analyse single fuel reciprocating engine plant faults	**4.1**	Causes of abnormal single fuel reciprocating engine plant operating conditions are identified, in accordance with workplace procedures, by analysing technical and operational information
	4.2	Corrective action is taken, in accordance with workplace procedures
	4.3	Single fuel reciprocating engine plant integrity and personnel safety is maintained, in accordance with workplace procedures, and in consultation with appropriate personnel and technical and operational documentation
5 Monitor and inspect single fuel reciprocating engine plant	**5.1**	Single fuel reciprocating engine plant to be monitored and inspected is physically identified, in accordance with workplace procedures
	5.2	Single fuel reciprocating engine plant is monitored and inspected to detect deviations, in accordance with workplace procedures
	5.3	Corrective action is taken, in accordance with workplace procedures
	5.4	Appropriate personnel are notified when defects are detected, in accordance with workplace procedures
6 Complete documentation	**6.1**	Single fuel reciprocating engine plant problems,

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movements, abnormalities and status are reported, in accordance with workplace procedures

6.2 Documentation is updated, in accordance with workplace procedures

Foundation Skills

Foundation skills essential to performance are explicit in the performance criteria of this unit of competency.

Range of Conditions

Range is restricted to essential operating conditions and any other variables essential to the work environment.

Non-essential conditions may be found in the Companion Volume Implementation Guide.

Unit Mapping Information

This unit replaces and is equivalent to UEPOPS247B Operate and monitor an internal combustion single fuel reciprocating engine.

Links

Companion Volume implementation guides are found in VETNet - https://vetnet.gov.au/Pages/TrainingDocs.aspx?q=1715b9fa-e7bd-441c-bb8d-cf22c9c825a8

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Assessment Requirements for UEPOPS247 Operate and monitor an internal combustion single fuel reciprocating engine

Modification History

Release 1. This is the first release of this unit of competency in the UEP Generation Training Package.

Performance Evidence

Evidence required to demonstrate competence in this unit must be relevant to and satisfy all the requirements of the elements, performance criteria and range of conditions on at least two separate occasions and includes:

- analysing single fuel engine plant faults using data analysis techniques and tools
- applying Work, Health and Safety (OHS)/Occupational Health and Safety (OHS) requirements including:
  - emergency procedures
  - risk controls
  - safe work practices
- communicating with personnel
- completing documentation using recording procedures
- complying with legislation, industry standards, codes of practice and regulations
- identifying single fuel engine plant status
- interpreting manufacturers' specifications and manuals
- monitoring and inspecting single fuel engine plant operation
- operating single fuel engines
- organising resources
- preparing and planning work
- preparing single fuel engine plant and/or equipment for operation
- recognising and responding to abnormal single fuel engine plant operating conditions
- testing single fuel engine plant operationally using diagnostic and testing techniques

Knowledge Evidence

Evidence required to demonstrate competence in this unit must be relevant to and satisfy all the requirements of the elements, performance criteria and range of conditions and includes knowledge of:

- legislation, industry standards, codes of practice and regulations
- manufacturers' specifications and manuals
- single fuel engine internal combustion reciprocating engine types and characteristics

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- single fuel engine plant and equipment, its location and operating parameters
- single fuel engine plant status
- WHS/OHS legislated requirements including:
  - emergency procedures
  - risk control measures
  - safe work practices
- workplace documentation
- workplace policies and procedures

Assessment Conditions

As a minimum, assessors must satisfy applicable regulatory requirements, which include requirements in the Standards for Registered Training Organisations current at the time of assessment.

As a minimum, assessment must satisfy applicable regulatory requirements, which include requirements in the Standards for Registered Training Organisations current at the time of assessment.

Assessment processes and techniques must be appropriate to the language, literacy and numeracy requirements of the work being performed and the needs of the candidate.

Assessment must occur in workplace operational situations. Where this is not appropriate, assessment must occur in simulated workplace operational situations that reflect workplace conditions.

Resources for assessment must include access to:

- a range of relevant exercises, case studies and/or other simulations
- relevant and appropriate materials, tools, equipment and personal protective equipment currently used in industry
- applicable documentation including workplace procedures, industry standards, equipment specifications, regulations, codes of practice and operation manuals.

Links

Companion Volume implementation guides are found in VETNet - https://vetnet.gov.au/Pages/TrainingDocs.aspx?q=1715b9fa-e7bd-441c-bb8d-cf22c9c825a8

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UEPOPS248 Operate and monitor an internal combustion dual fuel reciprocating engine

Modification History

Release 1. This is the first release of this unit of competency in the UEP Generation Training Package.

Application

This unit involves the skills and knowledge required to operate, inspect and monitor internal combustion dual fuel reciprocating engines.

Typically, internal combustion dual fuel reciprocating engines are fed with fossil fuels such as petrol, gas, diesel or oil. Internal combustion dual fuel reciprocating engines in the form of combustion turbines drive the largest electric generators.

Competency in this unit requires the ability to plan work, operate internal combustion dual fuel reciprocating engine plant, change fuel type during operation, test internal combustion dual fuel reciprocating engine plant operations, analyse internal combustion dual fuel reciprocating engine plant faults, monitor and inspect internal combustion dual fuel reciprocating engine plant and the completion of all documentation. Individuals will, in general, work under supervision, in a power generating facility as an operator.

Power generation plant operators are typically trained and authorised to isolate, prepare plant and issue permits to work.

No licensing, legislative or certification requirements apply to this unit at the time of publication.

Note: Workplace practice

The application of the skills and knowledge described in this unit may require a licence or training permit to practice in the workplace where work is carried out on gas and electrical installations. Additional conditions may apply under state and territory legislative and regulatory licensing requirements.

Pre-requisite Unit

There are no prerequisite units.

Competency Field

Operations

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Unit Sector

Electricity generation

Elements and Performance Criteria

ELEMENTS	PERFORMANCE CRITERIA
Elements describe the essential outcomes.	Performance criteria describe the performance needed to demonstrate achievement of the element.
1 Plan and prepare work	**1.1** Safety issues related to operating and monitoring internal combustion dual fuel reciprocating engines are identified, in accordance with workplace procedures and Work, Health and Safety (WHS)/Occupational Health and Safety (OHS) regulations and legislative requirements
	1.2 Work requirements are identified, in accordance with workplace procedures, from appropriate personnel and documentation
	1.3 Documentation to determine internal combustion dual fuel reciprocating engine plant status is assessed and evaluated, in accordance with workplace procedures
	1.4 Inspection and field preparations for internal combustion dual fuel reciprocating engine plant service are carried out, in accordance with workplace procedures and manufacturers' recommendations
	1.5 Internal combustion dual fuel reciprocating engine plant operational prerequisites are established, in accordance with workplace procedures and manufacturers' recommendations
	1.6 Sequence for recommissioning of internal combustion dual fuel reciprocating engine plant is determined, in accordance with workplace procedures and site requirements
2 Operate internal combustion dual fuel reciprocating engine plant	**2.1** Internal combustion dual fuel reciprocating engine plant is operated, in accordance with workplace procedures and manufacturers' operating recommendations
	2.2 Internal combustion dual fuel reciprocating engine plant is monitored and observed, in accordance with workplace procedures, to detect deviations from normal

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		operating conditions
	2.3	Corrective actions are taken to rectify internal combustion dual fuel reciprocating engine plant abnormalities, in accordance with workplace procedures and manufacturers' recommendations
3 Change fuel type during operation	**3.1**	Changeover of fuel type is monitored and observed, in accordance with workplace procedures, to detect deviations from expected results
	3.2	Corrective actions are taken, in accordance with workplace procedures and manufacturers' recommendations
4 Test internal combustion dual fuel reciprocating engine plant operation	**4.1**	Operational tests are performed, in accordance with workplace procedures
	4.2	Internal combustion dual fuel reciprocating engine plant is observed, in accordance with workplace procedures, for correct operational response
	4.3	Corrective action is taken, in accordance with workplace procedures, when response does not meet with documentation, plant integrity or personnel safety requirements
	4.4	Appropriate personnel are notified, in accordance with workplace procedures, when defects are detected
5 Analyse internal combustion dual fuel reciprocating engine plant faults	**5.1**	Cause of abnormal internal combustion dual fuel reciprocating engine plant operating conditions are identified, in accordance with workplace procedures, by analysing technical and operational information
	5.2	Corrective action is taken, in accordance with workplace procedures
	5.3	Internal combustion dual fuel reciprocating engine plant integrity and personnel safety is maintained, in accordance with workplace procedures, and in consultation with appropriate personnel and technical and operational documentation
6 Monitor and inspect internal combustion dual fuel reciprocating engine plant	**6.1**	Internal combustion dual fuel reciprocating engine plant to be monitored and inspected is physically identified, in accordance with workplace procedures

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	6.2	Internal combustion dual fuel reciprocating engine plant is monitored and inspected for normal operation or to detect deviations, in accordance with workplace procedures
	6.3	Corrective action is taken, in accordance with workplace procedures
	6.4	Appropriate personnel are notified, in accordance with workplace procedures, when defects are detected
7 Complete documentation	**7.1**	Internal combustion dual fuel reciprocating engine plant problems, abnormalities and status are reported in accordance with workplace procedures
	7.2	Documentation is updated, in accordance with workplace procedures

Foundation Skills

Foundation skills essential to performance are explicit in the performance criteria of this unit of competency.

Range of Conditions

Range is restricted to essential operating conditions and any other variables essential to the work environment.

Non-essential conditions may be found in the Companion Volume Implementation Guide.

Unit Mapping Information

This unit replaces and is equivalent to UEPOPS248B Operate and monitor an internal combustion dual fuel reciprocating engine.

Links

Companion Volume implementation guides are found in VETNet - https://vetnet.gov.au/Pages/TrainingDocs.aspx?q=1715b9fa-e7bd-441c-bb8d-cf22c9c825a8

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Assessment Requirements for UEPOPS248 Operate and monitor an internal combustion dual fuel reciprocating engine

Modification History

Release 1. This is the first release of this unit of competency in the UEP Generation Training Package.

Performance Evidence

Evidence required to demonstrate competence in this unit must be relevant to and satisfy all the requirements of the elements, performance criteria and range of conditions on at least two separate occasions and includes:

- analysing internal combustion dual reciprocating engine plant faults using data analysis techniques and tools
- applying dual fuel engine operational knowledge
- applying Work, Health and Safety (WHS)/Occupational Health and Safety (OHS) requirements including:
  - emergency procedures
  - risk control measures
  - safe working practices
- changing fuel type during operation
- communicating with personnel
- completing documentation
- complying with legislation, industry standards, codes of practice and regulations
- identifying internal combustion dual reciprocating engine plant status
- interpreting manufacturers' manuals and specifications
- monitoring and inspecting internal combustion dual reciprocating engine plant operations
- operating duel fuel engines
- preparing and planning work
- preparing internal combustion dual reciprocating engine plant and/or equipment for operation
- recognising and responding to abnormal internal combustion dual reciprocating engine plant operating conditions
- testing internal combustion dual reciprocating engine plant operationally using diagnostic and test techniques
- utilising fuel changeover equipment and/or systems
- working with permit to work system

Knowledge Evidence

Evidence required to demonstrate competence in this unit must be relevant to and satisfy all the

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requirements of the elements, performance criteria and range of conditions and includes knowledge of:

- internal combustion dual reciprocating engine plant and equipment, its location and operating parameters
- internal combustion dual reciprocating engine plant status including fuel changeover equipment
- internal combustion reciprocating engine types and characteristics
- legislation, industry standards, codes of practice and regulations
- manufacturers' specifications and manuals
- permit to work system
- typical arrangements of power production plant
- WHS/OHS legislated requirements including:
  - emergency procedures
  - risk control measures
  - safe work practices
- workplace documentation
- workplace policies and procedures

Assessment Conditions

As a minimum, assessors must satisfy applicable regulatory requirements, which include requirements in the Standards for Registered Training Organisations current at the time of assessment.

As a minimum, assessment must satisfy applicable regulatory requirements, which include requirements in the Standards for Registered Training Organisations current at the time of assessment.

Assessment processes and techniques must be appropriate to the language, literacy and numeracy requirements of the work being performed and the needs of the candidate.

Assessment must occur in workplace operational situations. Where this is not appropriate, assessment must occur in simulated workplace operational situations that reflect workplace conditions.

Resources for assessment must include access to:

- a range of relevant exercises, case studies and/or other simulations
- relevant and appropriate materials, tools, equipment and personal protective equipment currently used in industry
- applicable documentation including workplace procedures, industry standards, equipment specifications, regulations, codes of practice and operation manuals.

Links

Companion Volume implementation guides are found in VETNet - https://vetnet.gov.au/Pages/TrainingDocs.aspx?q=1715b9fa-e7bd-441c-bb8d-cf22c9c825a8

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UEPOPS249 Liaise with stakeholders

Modification History

Release 1. This is the first release of this unit of competency in the UEP Generation Training Package.

Application

This unit involves the skills and knowledge required to communicate with external and internal stakeholders.

Communication with stakeholders is about exchanging information, both verbal and non-verbal, with various internal and external personnel and organisations who may have an interest in the outcomes or activities of the workplace. Communicating with internal and external stakeholders requires the application of methods and techniques that enhance participation.

Competency in this unit requires the ability to plan and prepare for communication, communicate in writing, communicate orally, use communications systems and complete documentation. Individuals will, in general, work as an operator, in a power generation facility.

No licensing, legislative or certification requirements apply to this unit at the time of publication.

Note: Workplace practice

The application of the skills and knowledge described in this unit may require a licence or training permit to practice in the workplace where work is carried out on gas and electrical installations. Additional conditions may apply under state and territory legislative and regulatory licensing requirements.

Pre-requisite Unit

There are no prerequisite units.

Competency Field

Operations

Unit Sector

Electricity generation

Elements and Performance Criteria

ELEMENTS **PERFORMANCE CRITERIA**

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Elements describe the essential outcomes.	Performance criteria describe the performance needed to demonstrate achievement of the element.
1 Prepare for communication	**1.1** Communication requirements are identified and confirmed, in accordance with workplace procedures and Work, Health and Safety (WHS)/Occupational, Health and Safety (OHS) regulations
	1.2 Appropriate medium and tools for communication with stakeholders are determined
	1.3 Urgent or important information for stakeholders is provided
2 Communicate in writing	**2.1** Written communication is structured to provide or request information
	2.2 Format is identified, from analysis of available options and current circumstances
	2.3 Written communication is concisely and logically presented
	2.4 Information dissemination protocols and procedures are adhered to, in accordance with workplace policy
3 Communicate orally	**3.1** Oral communication for stakeholders is structured to provided or request information
	3.2 Oral communication is conveyed concisely, logically and appropriately
	3.3 Intent of oral communication is confirmed
	3.4 Information dissemination protocols and procedures are adhered to, in accordance with workplace policy
4 Use communications systems	**4.1** Communications system is used, in accordance with workplace procedures and manufacturers' recommendations
	4.2 Communications system, is maintained and updated, in accordance with workplace procedures
5 Complete documentation	**5.1** Communication equipment problems are reported, in accordance with workplace procedures
	5.2 Documentation is updated, in accordance with workplace procedures

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Foundation Skills

Foundation skills essential to performance are explicit in the performance criteria of this unit of competency.

Range of Conditions

Range is restricted to essential operating conditions and any other variables essential to the work environment.

Non-essential conditions may be found in the Companion Volume Implementation Guide.

Unit Mapping Information

This unit replaces and is equivalent to UEPOPS249B Liaise with stakeholders.

Links

Companion Volume implementation guides are found in VETNet - https://vetnet.gov.au/Pages/TrainingDocs.aspx?q=1715b9fa-e7bd-441c-bb8d-cf22c9c825a8

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Assessment Requirements for UEPOPS249 Liaise with stakeholders

Modification History

Release 1. This is the first release of this unit of competency in the UEP Generation Training Package.

Performance Evidence

Evidence required to demonstrate competence in this unit must be relevant to and satisfy all the requirements of the elements, performance criteria and range of conditions on at least two separate occasions and includes:

- applying Work, Health and Safety (WHS)/Occupational Health and Safety (OHS) requirements including:
  - emergency procedures
  - risk control measures
  - safe working practices
- communicating orally and in in writing
- completing documentation
- preparing for communication
- using appropriate communication mediums
- utilising communications systems

Knowledge Evidence

Evidence required to demonstrate competence in this unit must be relevant to and satisfy all the requirements of the elements, performance criteria and range of conditions and includes knowledge of:

- communication systems including electronic mediums
- verbal and written communication techniques
- WHS/OHS legislated requirements including:
  - emergency procedures
  - risk control measures
  - safe working practices
- workplace documentation
- workplace policies and procedures

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Assessment Conditions

As a minimum, assessors must satisfy applicable regulatory requirements, which include requirements in the Standards for Registered Training Organisations current at the time of assessment.

As a minimum, assessment must satisfy applicable regulatory requirements, which include requirements in the Standards for Registered Training Organisations current at the time of assessment.

Assessment processes and techniques must be appropriate to the language, literacy and numeracy requirements of the work being performed and the needs of the candidate.

Assessment must occur in workplace operational situations. Where this is not appropriate, assessment must occur in simulated workplace operational situations that reflect workplace conditions.

Resources for assessment must include access to:

- a range of relevant exercises, case studies and/or other simulations
- relevant and appropriate materials, tools, equipment and personal protective equipment currently used in industry
- applicable documentation including workplace procedures, industry standards, equipment specifications, regulations, codes of practice and operation manuals.

Links

Companion Volume implementation guides are found in VETNet - https://vetnet.gov.au/Pages/TrainingDocs.aspx?q=1715b9fa-e7bd-441c-bb8d-cf22c9c825a8

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UEPOPS251 Conduct routine wind turbine maintenance

Modification History

Release 1. This is the first release of this unit of competency in the UEP Generation Training Package.

Application

This unit involves the skills and knowledge required to conduct a range of routine maintenance functions associated with wind turbines. Routine maintenance functions associated with wind turbines are required to ensure the smooth operation of mechanical plant and equipment.

Competency in this unit requires the ability to plan for plant in-service checks, carry out in-service mechanical checks and complete work. Individuals will, in general, work as an operator in a power generation facility.

Power generation plant operators are typically trained and authorised to isolate, prepare plant and issue permits to work.

No licensing, legislative or certification requirements apply to this unit at the time of publication.

Note: Workplace practice

The application of the skills and knowledge described in this unit may require a licence or training permit to practice in the workplace where work is carried out on gas and electrical installations. Additional conditions may apply under state and territory legislative and regulatory licensing requirements.

Pre-requisite Unit

There are no prerequisite units.

Competency Field

Operations

Unit Sector

Electricity generation

Elements and Performance Criteria

ELEMENTS **PERFORMANCE CRITERIA**

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Elements describe the essential outcomes.	Performance criteria describe the performance needed to demonstrate achievement of the element.
1 Plan and prepare for work	**1.1** Work requirements are identified, in accordance with workplace procedures, from work orders and are confirmed with appropriate personnel or by site inspection
	1.2 Work, Health and Safety (WHS)Occupational, Health and Safety (OHS) regulations, legislative requirements, industry standards, codes of practice, manufacturers' specifications, environmental obligations and workplace procedures are identified, applied and monitored
	1.3 Resources are obtained and inspected, in accordance with workplace procedures, for compliance with job specification
	1.4 Plans, drawings and manuals are selected, in accordance with workplace procedures
	1.5 Correct size, type and quantity of materials and components are obtained and inspected, in accordance with workplace procedures
	1.6 Work sequenced and prioritised, in accordance with workplace procedures and site requirements
	1.7 Potential hazards are identified and risk control measures are selected, in accordance with workplace procedures
	1.8 Work area is prepared, in accordance with workplace procedures
2 Conduct routine maintenance	**2.1** Isolations are confirmed, where appropriate, in accordance with workplace procedures
	2.2 Routine maintenance on wind turbine is conducted, in accordance with workplace procedures and site requirements
	2.3 Minor adjustments of wind turbine are undertaken, in accordance with workplace procedures, maintenance schedules and site requirements
	2.4 Wind turbine faults are reported to appropriate personnel, in accordance with workplace procedures

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3 Complete work	**3.1** Maintenance work is completed and appropriate personnel are notified, in accordance with workplace procedures
	3.2 Work area is cleared of waste, cleaned, restored and secured, in accordance with workplace procedures
	3.3 Tools and equipment are maintained and stored, in accordance with workplace procedures
	3.4 Work completion details are finalised, in accordance with workplace procedures

Foundation Skills

Foundation skills essential to performance are explicit in the performance criteria of this unit of competency.

Range of Conditions

Range is restricted to essential operating conditions and any other variables essential to the work environment.

Non-essential conditions may be found in the Companion Volume Implementation Guide.

Unit Mapping Information

This unit replaces and is equivalent to UEPOPS251A Conduct routine wind turbine maintenance.

Links

Companion Volume implementation guides are found in VETNet - https://vetnet.gov.au/Pages/TrainingDocs.aspx?q=1715b9fa-e7bd-441c-bb8d-cf22c9c825a8

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Assessment Requirements for UEPOPS251 Conduct routine wind turbine maintenance

Modification History

Release 1. This is the first release of this unit of competency in the UEP Generation Training Package.

Performance Evidence

Evidence required to demonstrate competence in this unit must be relevant to and satisfy all the requirements of the elements, performance criteria and range of conditions on at least two separate occasions and includes:

- acquiring and analysing information related to wind turbine maintenance
- applying Work, Health and Safety (WHS)/Occupational Health and Safety (OHS) requirements including:
  - emergency procedures
  - risk control measures
  - safe working practices
- communicating with personnel
- completing work
- complying with legislation, industry standards, codes of practice and regulations
- conducting routine wind turbine maintenance
- interpreting manufacturers' specifications and manuals
- maintaining and retrieving records
- performing isolations
- planning and preparing for work including identifying and selecting materials
- storing and maintaining tools and equipment
- utilising routine wind turbine maintenance techniques
- working with permit to work system

Knowledge Evidence

Evidence required to demonstrate competence in this unit must be relevant to and satisfy all the requirements of the elements, performance criteria and range of conditions and includes knowledge of:

- acquiring and analysing wind turbine information
- equipment and materials required for maintenance work
- isolations
- legislation, industry standards, codes of practice and regulations

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- maintenance and retrieval of records
- manufacturers' specifications and manuals
- permit to work system
- routine wind turbine maintenance techniques
- typical arrangements of wind farm power plant
- WHS/OHS legislated requirements including:
  - emergency procedures
  - risk control measures
  - safe working procedures
- wind farm principles including wind turbine types and characteristics
- wind turbine plant and equipment, its location and operating parameters
- workplace documentation
- workplace policies and procedures

Assessment Conditions

As a minimum, assessors must satisfy applicable regulatory requirements, which include requirements in the Standards for Registered Training Organisations current at the time of assessment.

As a minimum, assessment must satisfy applicable regulatory requirements, which include requirements in the Standards for Registered Training Organisations current at the time of assessment.

Assessment processes and techniques must be appropriate to the language, literacy and numeracy requirements of the work being performed and the needs of the candidate.

Assessment must occur in workplace operational situations. Where this is not appropriate, assessment must occur in simulated workplace operational situations that reflect workplace conditions.

Resources for assessment must include access to:

- a range of relevant exercises, case studies and/or other simulations
- relevant and appropriate materials, tools, equipment and personal protective equipment currently used in industry
- applicable documentation including workplace procedures, industry standards, equipment specifications, regulations, codes of practice and operation manuals.

Links

Companion Volume implementation guides are found in VETNet - https://vetnet.gov.au/Pages/TrainingDocs.aspx?q=1715b9fa-e7bd-441c-bb8d-cf22c9c825a8

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UEPOPS252 Undertake local systems operations

Modification History

Release 1. This is the first release of this unit of competency in the UEP Generation Training Package.

Application

This unit involves the skills and knowledge required to operate power generating plant as a local systems operation, in conjunction with coordinated systems, under the control of appropriate authorised personnel.

The operation, configuration and implementation of power generation systems and plant should be considered and reviewed when undertaking local systems operations.

Competency in this unit requires the ability to plan and prepare work, operate plant and complete work. Individuals will, in general, work as an operator, in a power generation facility.

Power generation plant operators are typically trained and authorised to isolate, prepare plant and issue permits to work.

No licensing, legislative or certification requirements apply to this unit at the time of publication.

Note: Workplace practice

The application of the skills and knowledge described in this unit may require a licence or training permit to practice in the workplace where work is carried out on gas and electrical installations. Additional conditions may apply under state and territory legislative and regulatory licensing requirements.

Pre-requisite Unit

There are no prerequisite units.

Competency Field

Operations

Unit Sector

Electricity generation

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Elements and Performance Criteria

ELEMENTS	PERFORMANCE CRITERIA
Elements describe the essential outcomes.	Performance criteria describe the performance needed to demonstrate achievement of the element.
1 Plan and prepare work	**1.1** Safety issues are identified, in accordance with workplace procedures, to comply with Work, Health and Safety (WHS)/Occupational Health and Safety (OHS) regulations and industry standards
	1.2 Work requirements are identified from appropriate personnel and documentation, in accordance with workplace procedures
	1.3 Local system operations plant status is confirmed, in accordance with workplace procedures and instructions
	1.4 Preoperational checks are carried out on local system operations plant, in accordance with workplace procedures and instructions
2 Operate plant	**2.1** System components to be locally controlled are identified and operated, in accordance with workplace procedures and instructions
	2.2 Local system operations plant is operated within limits of its design specification and site requirements, in accordance with workplace procedures
	2.3 Local system operations plant is monitored, observed and tested, in accordance with workplace procedures, to detect deviations from normal operating conditions
3 Complete documentation	**3.1** Local system operations plant problems, movements, and status are reported, in accordance with workplace procedures
	3.2 Documentation is updated, in accordance with workplace procedures

Foundation Skills

Foundation skills essential to performance are explicit in the performance criteria of this unit of competency.

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Range of Conditions

Range is restricted to essential operating conditions and any other variables essential to the work environment.

Non-essential conditions may be found in the Companion Volume Implementation Guide.

Unit Mapping Information

This unit replaces and is equivalent to UEPOPS252A Undertake local systems operations.

Links

Companion Volume implementation guides are found in VETNet - https://vetnet.gov.au/Pages/TrainingDocs.aspx?q=1715b9fa-e7bd-441c-bb8d-cf22c9c825a8

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Assessment Requirements for UEPOPS252 Undertake local systems operations

Modification History

Release 1. This is the first release of this unit of competency in the UEP Generation Training Package.

Performance Evidence

Evidence required to demonstrate competence in this unit must be relevant to and satisfy all the requirements of the elements, performance criteria and range of conditions on at least two separate occasions and includes:

- applying Work, Health and Safety (WHS)/Occupational Health and Safety (OHS) requirements including:
  - emergency procedures
  - risk control measures
  - safe working procedures
- communicating with personnel
- completing documentation
- complying with legislation, industry standards, codes of practice and regulations
- fault testing and identification, including:
  - equipment running tests
  - post maintenance operating tests
  - standby plant tests
- operating plant and equipment
- planning and preparing work

Knowledge Evidence

Evidence required to demonstrate competence in this unit must be relevant to and satisfy all the requirements of the elements, performance criteria and range of conditions and includes knowledge of:

- fault test identification from standby plant, post maintenance operating and equipment running tests
- legislation, industry standards, codes of practice and regulations
- operation of power generating plant or equipment in local systems operations
- WHS/OHS legislated requirements including:
  - emergency procedures
  - risk control measures

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  - safe working procedures
- workplace documentation
- workplace policies and procedures

Assessment Conditions

As a minimum, assessors must satisfy applicable regulatory requirements, which include requirements in the Standards for Registered Training Organisations current at the time of assessment.

As a minimum, assessment must satisfy applicable regulatory requirements, which include requirements in the Standards for Registered Training Organisations current at the time of assessment.

Assessment processes and techniques must be appropriate to the language, literacy and numeracy requirements of the work being performed and the needs of the candidate.

Assessment must occur in workplace operational situations. Where this is not appropriate, assessment must occur in simulated workplace operational situations that reflect workplace conditions.

Resources for assessment must include access to:

- a range of relevant exercises, case studies and/or other simulations
- relevant and appropriate materials, tools, equipment and personal protective equipment currently used in industry
- applicable documentation including workplace procedures, industry standards, equipment specifications, regulations, codes of practice and operation manuals.

Links

Companion Volume implementation guides are found in VETNet - https://vetnet.gov.au/Pages/TrainingDocs.aspx?q=1715b9fa-e7bd-441c-bb8d-cf22c9c825a8

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UEPOPS301 Conduct single energy source isolation procedures for permit to work

Modification History

Release 1. This is the first release of this unit of competency in the UEP Generation Training Package.

Application

This unit involves the skills and knowledge required to conduct single energy source isolation procedures for permits to work.

A permit to work system is a formal method used to control certain types of work that can be potentially hazardous. A permit to work specifies the work to be completed, the precautions to be taken and the timeframe for completion.

Competency in this unit requires the ability to plan and prepare for isolation, de-isolation and restoration, perform isolation and perform de-isolation and restoration. Individuals will, in general, work as an operator in a power generation facility.

Power generation plant operators are typically trained and authorised to isolate, prepare plant and issue permits to work.

No licensing, legislative or certification requirements apply to this unit at the time of publication.

Note: Workplace procedures

The application of the skills and knowledge described in this unit may require a licence or training permit to practice in the workplace where work is carried out on gas and electrical installations. Additional conditions may apply under state and territory legislative and regulatory licensing requirements.

Pre-requisite Unit

There are no prerequisite units.

Competency Field

Operations

Unit Sector

Electricity generation

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Elements and Performance Criteria

ELEMENTS	PERFORMANCE CRITERIA
Elements describe the essential outcomes.	Performance criteria describe the performance needed to demonstrate achievement of the element.
1 Plan and prepare for single energy source isolation	**1.1** Work requirements, including permits to work, are identified, in accordance with workplace procedures and are confirmed with appropriate personnel or by site inspection
	1.2 Safety issues including Work, Health and Safety (WHS)/Occupational Health and Safety (OHS) regulations and industry standards are identified, in accordance with workplace procedures
	1.3 Materials, tools, equipment and resources are obtained and inspected, in accordance with workplace procedures
	1.4 Isolation work is sequenced and prioritised, in accordance with workplace procedures and permit requirements
	1.5 Permit to work is coordinated with other personnel involved in, or affected by isolations, in accordance with workplace procedures
	1.6 Personnel participating in work are briefed, with roles and responsibilities confirmed, in accordance with workplace procedures
2 Perform single energy source isolation	**2.1** Single energy source to be isolated, is correctly identified, in accordance with workplace procedures
	2.2 Isolation is performed, in accordance with workplace procedures and permit to work requirements
	2.3 Isolation, dissipation and restraint of energy sources is verified, in accordance with workplace procedures
	2.4 Isolation is confirmed, in accordance with workplace procedures
3 Perform single energy source de-isolation and restoration	**3.1** Single energy source de-isolation and restorations are performed, in accordance with workplace procedures and permit requirements
	3.2 Single energy source de-isolations are confirmed, in

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accordance with workplace procedures

3.3 Work completion details are finalised, in accordance with workplace procedures

Foundation Skills

Foundation skills essential to performance are explicit in the performance criteria of this unit of competency.

Range of Conditions

Range is restricted to essential operating conditions and any other variables essential to the work environment.

Non-essential conditions may be found in the Companion Volume Implementation Guide.

Unit Mapping Information

This unit replaces and is equivalent to UEPOPS301B Conduct single energy source isolation procedures for permit to work.

Links

Companion Volume implementation guides are found in VETNet - https://vetnet.gov.au/Pages/TrainingDocs.aspx?q=1715b9fa-e7bd-441c-bb8d-cf22c9c825a8

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Assessment Requirements for UEPOPS301 Conduct single energy source isolation procedures for permit to work

Modification History

Release 1. This is the first release of this unit of competency in the UEP Generation Training Package.

Performance Evidence

Evidence required to demonstrate competence in this unit must be relevant to and satisfy all the requirements of the elements, performance criteria and range of conditions on at least two separate occasions and includes:

- applying Work, Health and Safety (WHS)/Occupational Health and Safety (OHS) requirements including:
  - emergency procedures
  - hazard identification
  - risk control measures
  - safe working practices
- communicating with personnel
- completing de-isolations and restorations
- completing documentation
- coordinating and briefing others on permit to work
- identifying power generating plant status
- implementing legislation, industry standards, codes of practice and regulations
- interpreting power generation plant and equipment diagrams
- obtaining authorisation for single energy source isolation
- performing isolations, de-isolations and restorations
- planning and preparing for isolation, de-isolation and restoration
- preparing power generating plant or equipment for isolation operation
- using permit to work system
- utilising isolations including lock and tag systems
- working with equipment, tools, materials and resources

Knowledge Evidence

Evidence required to demonstrate competence in this unit must be relevant to and satisfy all the requirements of the elements, performance criteria and range of conditions and includes knowledge of:

- documentation requirements

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- equipment, tools, materials and resources for use
- legislation, industry standards, codes of practice and regulations
- lock and tag system
- manufacturers' specifications and manuals
- permit to work system
- power generating plant and equipment, its location and operating parameters
- power generating plant status
- power generation plant and equipment drawings and diagrams
- single energy source isolations, mechanical isolations, de-isolations and restorations methods and techniques
- typical arrangements of power production plant
- WHS/OHS legislated requirements including:
  - emergency procedures
  - hazard identification
  - risk control measures
  - safe working practices
- workplace documentation
- workplace policies and procedures

Assessment Conditions

As a minimum, assessors must satisfy applicable regulatory requirements, which include requirements in the Standards for Registered Training Organisations current at the time of assessment.

As a minimum, assessment must satisfy applicable regulatory requirements, which include requirements in the Standards for Registered Training Organisations current at the time of assessment.

Assessment processes and techniques must be appropriate to the language, literacy and numeracy requirements of the work being performed and the needs of the candidate.

Assessment must occur in workplace operational situations. Where this is not appropriate, assessment must occur in simulated workplace operational situations that reflect workplace conditions.

Resources for assessment must include access to:

- a range of relevant exercises, case studies and/or other simulations
- relevant and appropriate materials, tools, equipment and personal protective equipment currently used in industry
- applicable documentation including workplace procedures, industry standards, equipment specifications, regulations, codes of practice and operation manuals.

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Companion Volume implementation guides are found in VETNet - https://vetnet.gov.au/Pages/TrainingDocs.aspx?q=1715b9fa-e7bd-441c-bb8d-cf22c9c825a8

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UEPOPS309 Operate and monitor air conditioning plant and ventilation systems

Modification History

Release 1. This is the first release of this unit of competency in the UEP Generation Training Package.

Application

This unit involves the skills and knowledge required to operate and monitor air conditioning plant, ventilation systems and associated equipment.

Air conditioning is used to cool and/or dehumidify a variety of plant that is heat producing in power generation facilities. Ventilation is the process of changing or replacing air to control temperatures or remove a combination of moisture, odour, smoke, heat, dust, airborne bacteria, carbon dioxide or to replenish oxygen.

Competency in this unit requires the ability to plan work, operate and monitor air conditioning plant and ventilation systems, test air conditioning plant and ventilation system operations, identify air conditioning plant and ventilation system faults, monitor and inspect air conditioning plant and ventilation system and the completion of all documentation. Individuals will, in general, work under supervision, in a power generation facility as an operator.

Power generation plant operators are typically trained and authorised to isolate, prepare plant and issue permits to work.

No licensing, legislative or certification requirements apply to this unit at the time of publication.

Note: Workplace practice

The application of the skills and knowledge described in this unit may require a licence or training permit to practice in the workplace where work is carried out on gas and electrical installations. Additional conditions may apply under state and territory legislative and regulatory licensing requirements.

Pre-requisite Unit

There are no prerequisite units.

Competency Field

Operations

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Unit Sector

Electricity generation

Elements and Performance Criteria

ELEMENTS	PERFORMANCE CRITERIA
Elements describe the essential outcomes.	Performance criteria describe the performance needed to demonstrate achievement of the element.
1 Plan and prepare for work	**1.1** Safety issues related to operating and monitoring air conditioning plant and ventilation systems are identified, in accordance with workplace procedures and Work, Health and Safety (WHS)/Occupational Health and Safety (OHS) regulations and legislative requirements
	1.2 Work, air conditioning plant and ventilation system and resource requirements are identified, in accordance with workplace procedures, and from relevant personnel and documentation
	1.3 Quality assurance requirements are identified, in accordance with workplace procedures
	1.4 Documentation to determine air conditioning plant and ventilation system status is assessed and evaluated, in accordance with workplace procedures
	1.5 Inspection and field preparation for air conditioning plant and ventilation system service is carried out, in accordance with workplace and manufacturers' procedures
	1.6 Air conditioning plant and ventilation system operational prerequisites are established, in accordance with workplace procedures and manufacturers' recommendations
	1.7 Sequence and air conditioning plant and ventilation system requirements for operation is determined, in accordance with workplace procedures and site requirements
	1.8 Reporting requirements are carried out, in accordance with workplace procedures
2 Perform operation and monitoring of air	**2.1** Air conditioning plant and ventilation system is operated and shut down, in accordance with workplace

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conditioning equipment and ventilation systems		procedures and manufacturers' operating recommendations
	2.2	Air conditioning plant and ventilation system is monitored and observed, in accordance with workplace procedures, to detect deviations from normal operating conditions
	2.3	Air conditioning plant and ventilation system performance and quality is monitored, in accordance with workplace procedures, including temperature and airflow humidity
	2.4	Corrective actions are taken to rectify abnormalities, in accordance with workplace procedures, industry standards and site requirements
3 Test air conditioning and ventilation system plant operation	**3.1**	Operational tests are performed, in accordance with workplace procedures
	3.2	Corrective action is taken, in accordance with workplace procedures, when response does not meet with documentation, air conditioning and ventilation system plant integrity or personnel safety requirements
	3.3	Air conditioning plant and ventilation system is returned to required operational status upon completion of testing, in accordance with workplace procedures
4 Identify air conditioning and ventilation system plant faults	**4.1**	Causes of abnormal air conditioning and ventilation system plant operating conditions are identified, in accordance with workplace procedures, and by analysis of technical and operational information
	4.2	Corrective action is taken, in accordance with workplace procedures
	4.3	Air conditioning plant and ventilation system integrity and personnel safety is maintained, in accordance with workplace procedures, and in consultation with appropriate personnel and technical and operational documentation
5 Monitor and inspect air conditioning and ventilation system plant	**5.1**	Air conditioning plant and ventilation system to be monitored and inspected is physically identified, in accordance with workplace procedures
	5.2	Air conditioning plant and ventilation system is monitored and inspected, in accordance with workplace

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		procedures, for normal operation or to detect deviations
	5.3	Corrective action is taken, in accordance with workplace procedures
	5.4	Appropriate personnel are notified when defects are detected, in accordance with workplace procedures
6 Complete documentation	**6.1**	Air conditioning plant and ventilation system problems, movements and status are reported, in accordance with workplace procedures
	6.2	Documentation is updated, in accordance with workplace procedures

Foundation Skills

Foundation skills essential to performance are explicit in the performance criteria of this unit of competency.

Range of Conditions

Range is restricted to essential operating conditions and any other variables essential to the work environment.

Non-essential conditions may be found in the Companion Volume Implementation Guide.

Unit Mapping Information

This unit replaces and is equivalent to UEPOPS309B Operate and monitor air conditioning plant and ventilation systems.

Links

Companion Volume implementation guides are found in VETNet - https://vetnet.gov.au/Pages/TrainingDocs.aspx?q=1715b9fa-e7bd-441c-bb8d-cf22c9c825a8

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Assessment Requirements for UEPOPS309 Operate and monitor air conditioning plant and ventilation systems

Modification History

Release 1. This is the first release of this unit of competency in the UEP Generation Training Package.

Performance Evidence

Evidence required to demonstrate competence in this unit must be relevant to and satisfy all the requirements of the elements, performance criteria and range of conditions on at least two separate occasions and includes:

- applying Work, Health and Safety (WHS)/Occupational Health and Safety (OHS) requirements including:
  - emergency procedures
  - risk control measures
  - safe working practices
- communicating with personnel
- completing documentation using recording procedures
- identifying air conditioning plant and ventilation system status
- implementing legislation, industry standards, codes of practice and regulations
- interpreting manufacturers' specifications and manuals
- monitoring and inspecting air conditioning plant and ventilation system
- operating air conditioning plant and ventilation system including temperature and air flow using data analysis techniques and tools
- operating and monitoring air conditioning plant, equipment and ventilation system
- organising resources
- preparing air conditioning plant and ventilation system for operation
- preparing and planning work
- recognising and responding to abnormal faults in air conditioning plant and ventilation system operating conditions
- testing air conditioning plant and ventilation system operation using diagnostic test techniques and procedures
- utilising repair techniques and procedures
- working with permit to work system

Knowledge Evidence

Evidence required to demonstrate competence in this unit must be relevant to and satisfy all the requirements of the elements, performance criteria and range of conditions and includes

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knowledge of:

- air conditioning and ventilation system plant status manufacturers' specifications and manuals
- legislation, industry standards, codes of practice and regulations
- permit to work system
- typical arrangements of power production plant
- plant and equipment, its location and operating parameters including:
  - air conditioner systems
  - ventilation systems
  - refrigerant gases
- WHS/OHS legislated requirements including:
  - emergency procedures
  - risk control measures
  - safe working practices
- workplace documentation
- workplace policies and procedures

Assessment Conditions

As a minimum, assessors must satisfy applicable regulatory requirements, which include requirements in the Standards for Registered Training Organisations current at the time of assessment.

As a minimum, assessment must satisfy applicable regulatory requirements, which include requirements in the Standards for Registered Training Organisations current at the time of assessment.

Assessment processes and techniques must be appropriate to the language, literacy and numeracy requirements of the work being performed and the needs of the candidate.

Assessment must occur in workplace operational situations. Where this is not appropriate, assessment must occur in simulated workplace operational situations that reflect workplace conditions.

Resources for assessment must include access to:

- a range of relevant exercises, case studies and/or other simulations
- relevant and appropriate materials, tools, equipment and personal protective equipment currently used in industry
- applicable documentation including workplace procedures, industry standards, equipment specifications, regulations, codes of practice and operation manuals.

Links

Companion Volume implementation guides are found in VETNet - https://vetnet.gov.au/Pages/TrainingDocs.aspx?q=1715b9fa-e7bd-441c-bb8d-cf22c9c825a8

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UEPOPS310 Operate bulk coal handling plant

Modification History

Release 1. This is the first release of this unit of competency in the UEP Generation Training Package.

Application

This unit involves the skills and knowledge required to address the storage, reclaiming and despatching of bulk coal. It also encompasses monitoring any associated mobile bulk coal handling plant operations.

Bulk coal handling plant is used to convey coal from rail transport wagons to boilers or storage bunkers. They are also used to process raw coal, to crush and stack coal to feed directly into power generation facilities.

Competency in this unit requires the ability to plan and prepare work, operate bulk coal handling plant, inspect, test, analyse and report bulk coal handling plant faults and complete documentation. Individuals will, in general, work under supervision, in a power generation facility as an operator.

Power generation plant operators are typically trained and authorised to isolate, prepare plant and issue permits to work.

No licensing, legislative or certification requirements apply to this unit at the time of publication.

Note: Workplace practice

The application of the skills and knowledge described in this unit may require a licence or training permit to practice in the workplace where work is carried out on gas and electrical installations. Additional conditions may apply under state and territory legislative and regulatory licensing requirements.

Pre-requisite Unit

There are no prerequisite units.

Competency Field

Operations

Unit Sector

Electricity generation

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Elements and Performance Criteria

ELEMENTS	PERFORMANCE CRITERIA
Elements describe the essential outcomes.	Performance criteria describe the performance needed to demonstrate achievement of the element.
1 Plan and prepare work	**1.1** Safety issues are identified, in accordance with Work, Health and Safety (WHS)/Occupational Health and Safety (OHS) regulations, legislative requirements, industry standards and workplace procedures
	1.2 Work, bulk coal handling plant and resource requirements are identified from appropriate personnel and documentation, in accordance with workplace procedures
	1.3 Quality assurance requirements recognised and adhered to, in accordance with workplace procedures and industry standards
	1.4 Basic mineralogy information is applied, in accordance with workplace procedures and site requirements
	1.5 Work schedule is consistent with job requirements, in accordance with workplace procedures
	1.6 Pad is prepared for coal stockpiling, including removal of contaminants and drainage, in accordance with workplace procedures
	1.7 Preoperational checks are carried out on bulk coal handling plant, in accordance with manufacturers' recommendations and workplace procedures
	1.8 Sequence for recommissioning of bulk coal handling plant is determined, in accordance with workplace procedures
2 Conduct operation of bulk coal handling plant	**2.1** Start up, park up and shut down procedures are carried out, in accordance with manufacturers' recommendations, workplace procedures and site specific requirements
	2.2 Bulk coal handling plant is operated, in accordance with workplace procedures and manufacturers' recommendations
	2.3 Bulk coal handling plant is monitored, in accordance with workplace procedures, to detect deviations from

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		normal operating conditions
	2.4	Corrective actions are taken to rectify bulk coal handling plant abnormalities, in accordance with industry standards and workplace procedures
	2.5	Bulk coal handling plant to be removed from service is identified and isolated, in accordance with workplace procedures
	2.6	Inspection and fault finding are carried out, in accordance with manufacturers' recommendations and workplace procedures
	2.7	Coal is placed or bunkered down in predetermined stockpile location, in accordance with workplace procedures
	2.8	Reclaim specifications are received, despatch area is notified and equipment is made ready, in accordance with workplace procedures
	2.9	Specified coal is blended, loaded, sampled and despatched, in accordance with workplace procedures
3 Test bulk coal handling plant operation	**3.1**	Tests are performed, in accordance with workplace procedures
	3.2	Bulk coal handling plant is observed for correct operational response, in accordance with workplace procedures
	3.3	Corrective action is taken when response does not meet with documentation, workplace procedures, bulk coal handling plant integrity or personnel safety requirements
	3.4	Bulk coal handling plant is returned to required operational status upon completion of testing, in accordance with workplace procedures
4 Analyse bulk coal handling plant faults	**4.1**	Causes of abnormal bulk coal handling plant operating conditions are identified, in accordance with workplace procedures, by analysing technical and operational information
	4.2	Corrective action is taken, in accordance with workplace procedures
	4.3	Supplementary personnel are arranged for investigation of identified operational abnormalities, if required, in

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		accordance with workplace procedures
5 Inspect bulk coal handling plant	**5.1**	Bulk coal handling plant to be inspected is physically identified, in accordance with workplace procedures
	5.2	Bulk coal handling plant is inspected, in accordance with workplace procedures, to detect deviations from normal operating conditions
	5.3	Appropriate personnel are notified, in accordance with workplace procedures, when defects are detected
6 Complete documentation	**6.1**	Bulk coal handling plant problems, movements and status are reported, in accordance with workplace procedures
	6.2	Documentation is updated, in accordance with workplace procedures

Foundation Skills

Foundation skills essential to performance are explicit in the performance criteria of this unit of competency.

Range of Conditions

Range is restricted to essential operating conditions and any other variables essential to the work environment.

Non-essential conditions may be found in the Companion Volume Implementation Guide.

Unit Mapping Information

This unit replaces and is equivalent to UEPOPS310B Operate bulk coal handling plant.

Links

Companion Volume implementation guides are found in VETNet - https://vetnet.gov.au/Pages/TrainingDocs.aspx?q=1715b9fa-e7bd-441c-bb8d-cf22c9c825a8

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Assessment Requirements for UEPOPS310 Operate bulk coal handling plant

Modification History

Release 1. This is the first release of this unit of competency in the UEP Generation Training Package.

Performance Evidence

Evidence required to demonstrate competence in this unit must be relevant to and satisfy all the requirements of the elements, performance criteria and range of conditions on at least two separate occasions and includes:

- applying Work, Health and Safety (WHS)/Occupational Health and Safety (OHS) including:
  - emergency procedures
  - risk control measures
  - safe working practices
- blending and bunkering coal
- communicating with personnel
- completing documentation
- identifying and inspecting bulk coal handling plant status
- implementing legislation, industry standards, codes of practice and regulations
- interpreting manufacturers' specifications and manuals
- monitoring bulk coal handling plant operation
- operating bulk coal handling plant
- organising resources
- preparing and planning bulk coal handling plant and equipment
- recognising and responding to abnormal bulk coal handling plant operating conditions
- reporting on bulk coal handling plant status
- testing bulk coal handling plant using diagnostic and data analysis techniques
- using measuring and testing instruments to identify faults and abnormalities

Knowledge Evidence

Evidence required to demonstrate competence in this unit must be relevant to and satisfy all the requirements of the elements, performance criteria and range of conditions and includes knowledge of:

- bulk coal handling plant and equipment, its location and operating parameters
- coal blending procedures
- legislation, industry standards, codes of practice and regulations

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- manufacturers' specifications and manuals
- testing and fault finding techniques
- typical arrangements of power production plant
- WHS/OHS regulations including:
  - risk control measures
  - emergency procedures
  - safe working practices
- workplace documentation
- workplace policies and procedures

Assessment Conditions

As a minimum, assessors must satisfy applicable regulatory requirements, which include requirements in the Standards for Registered Training Organisations current at the time of assessment.

As a minimum, assessment must satisfy applicable regulatory requirements, which include requirements in the Standards for Registered Training Organisations current at the time of assessment.

Assessment processes and techniques must be appropriate to the language, literacy and numeracy requirements of the work being performed and the needs of the candidate.

Assessment must occur in workplace operational situations. Where this is not appropriate, assessment must occur in simulated workplace operational situations that reflect workplace conditions.

Resources for assessment must include access to:

- a range of relevant exercises, case studies and/or other simulations
- relevant and appropriate materials, tools, equipment and personal protective equipment currently used in industry
- applicable documentation including workplace procedures, industry standards, equipment specifications, regulations, codes of practice and operation manuals.

Links

Companion Volume implementation guides are found in VETNet - https://vetnet.gov.au/Pages/TrainingDocs.aspx?q=1715b9fa-e7bd-441c-bb8d-cf22c9c825a8

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UEPOPS311 Operate fabric filter dust collection plant

Modification History

Release 1. This is the first release of this unit of competency in the UEP Generation Training Package.

Application

This unit involves the skills and knowledge required to operate, inspect and monitor fabric filter dust collection plant associated with coal fired power stations.

Dust collection plant is used to enhance the quality of air released from power generation processes. It typically consists of a blower, dust filter, a filter cleaning system and a dust receptacle or dust removal system.

Competency in this unit requires the ability to plan and prepare work, operate fabric filter dust collection plant, test, analyse, monitor, inspect and report dust collection plant faults and complete documentation. Individuals will, in general, work under supervision, in a power generation facility as an operator.

Power generation plant operators are typically trained and authorised to isolate, prepare plant and issue permits to work.

No licensing, legislative or certification requirements apply to this unit at the time of publication.

Note: Workplace practice

The application of the skills and knowledge described in this unit may require a licence or training permit to practice in the workplace where work is carried out on gas and electrical installations. Additional conditions may apply under state and territory legislative and regulatory licensing requirements.

Pre-requisite Unit

There are no prerequisite units.

Competency Field

Operations

Unit Sector

Electricity generation

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Elements and Performance Criteria

ELEMENTS	PERFORMANCE CRITERIA
Elements describe the essential outcomes.	Performance criteria describe the performance needed to demonstrate achievement of the element.
1 Plan and prepare work	**1.1** Safety issues are identified, in accordance with Work, Health and Safety (WHS)/Occupational Health and Safety (OHS) regulations, industry standards and workplace procedures
	1.2 Work requirements are identified from appropriate personnel and documentation, in accordance with workplace procedures
	1.3 Inspection, preoperational checks and field preparations for fabric filter dust collection service are carried out, in accordance with manufacturers' recommendations and workplace procedures
	1.4 Fabric filter dust collection plant operational prerequisites are identified, in accordance with manufacturers' recommendations and workplace procedures
	1.5 Sequence for recommissioning fabric filter dust collection plant is determined, in accordance with workplace procedures and site requirements
2 Conduct fabric filter dust collection plant operation	**2.1** Fabric filter dust collection plant is operated in accordance with manufacturers' specifications and workplace procedures
	2.2 Fabric filter dust collection plant is monitored, in accordance workplace procedures, to detect deviations from normal operating conditions
	2.3 Corrective actions are taken to rectify fabric filter dust collection plant abnormalities, in accordance with industry standards and workplace procedures
3 Test fabric filter dust collection plant operation	**3.1** Tests are performed, in accordance with workplace procedures
	3.2 Corrective action is taken when fabric filter dust collection plant response does not meet documentation, plant integrity or personnel safety requirements

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	3.3	Fabric filter dust collection plant is returned to required operational status upon completion of testing, in accordance with workplace procedures
4 Analyse fabric filter dust collection plant faults	**4.1**	Causes of abnormal fabric filter dust collection plant operating conditions are identified, in accordance with workplace procedures, by analysing technical and operational information
	4.2	Fabric filter dust collection plant integrity and personnel safety is maintained, in accordance with workplace procedures, through consultation with appropriate personnel and technical and operational documentation
5 Monitor and inspect fabric filter dust collection plant	**5.1**	Fabric filter dust collection plant to be monitored or inspected is physically identified in accordance with workplace procedures
	5.2	Appropriate personnel are notified, in accordance with workplace procedures, when defects are detected
6 Complete documentation	**6.1**	Fabric filter dust collection plant problems, movements and status are reported, in accordance with workplace procedures
	6.2	Documentation is updated, in accordance with workplace procedures

Foundation Skills

Foundation skills essential to performance are explicit in the performance criteria of this unit of competency.

Range of Conditions

Range is restricted to essential operating conditions and any other variables essential to the work environment.

Non-essential conditions may be found in the Companion Volume Implementation Guide.

Unit Mapping Information

This unit replaces and is equivalent to UEPOPS311B Operate fabric filter dust collection plant.

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Links

Companion Volume implementation guides are found in VETNet - https://vetnet.gov.au/Pages/TrainingDocs.aspx?q=1715b9fa-e7bd-441c-bb8d-cf22c9c825a8

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Assessment Requirements for UEPOPS311 Operate fabric filter dust collection plant

Modification History

Release 1. This is the first release of this unit of competency in the UEP Generation Training Package.

Performance Evidence

Evidence required to demonstrate competence in this unit must be relevant to and satisfy all the requirements of the elements, performance criteria and range of conditions on at least two separate occasions and includes:

- applying Work, Health and Safety (WHS)/Occupational Health and Safety (OHS) including:
  - emergency procedures
  - risk control measures:
  - safe working practices
- communicating with personnel
- completing documentation using recording procedures
- identifying and inspecting fabric filter dust collection plant status
- implementing legislation, industry standards, codes of practice and regulations
- interpreting manufacturers' manuals and specifications
- monitoring fabric filter dust collection plant operation
- operating fabric filter dust collection plant
- operationally testing fabric filter dust collection plant using diagnostic and data analysis techniques
- organising resources
- preparing fabric filter dust collection plant and equipment
- recognising and responding to abnormal fabric filter dust collection plant operating conditions
- reporting on fabric filter dust collection plant status
- using measurement and testing instruments to identify and analyse faults and abnormalities
- working with permit to work system

Knowledge Evidence

Evidence required to demonstrate competence in this unit must be relevant to and satisfy all the requirements of the elements, performance criteria and range of conditions and includes knowledge of:

- fabric filter dust collection plant and equipment, its location and operating parameters
- fabric filter dust collection plant status

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- legislation, industry standards, codes of practice and regulations
- manufacturers' specifications and manuals
- operation of fabric filter dust collection plant
- permit to work system
- power generation plant and equipment, its location and operating parameters
- test and fault finding techniques
- typical arrangements of power production plant
- WHS/OHS regulations including:
  - emergency procedures
  - risk control measures
  - safe working practices
- workplace documentation
- workplace policies and procedures

Assessment Conditions

As a minimum, assessors must satisfy applicable regulatory requirements, which include requirements in the Standards for Registered Training Organisations current at the time of assessment.

As a minimum, assessment must satisfy applicable regulatory requirements, which include requirements in the Standards for Registered Training Organisations current at the time of assessment.

Assessment processes and techniques must be appropriate to the language, literacy and numeracy requirements of the work being performed and the needs of the candidate.

Assessment must occur in workplace operational situations. Where this is not appropriate, assessment must occur in simulated workplace operational situations that reflect workplace conditions.

Resources for assessment must include access to:

- a range of relevant exercises, case studies and/or other simulations
- relevant and appropriate materials, tools, equipment and personal protective equipment currently used in industry
- applicable documentation including workplace procedures, industry standards, equipment specifications, regulations, codes of practice and operation manuals.

Links

Companion Volume implementation guides are found in VETNet - https://vetnet.gov.au/Pages/TrainingDocs.aspx?q=1715b9fa-e7bd-441c-bb8d-cf22c9c825a8

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UEPOPS312 Operate and monitor fuel supply

Modification History

Release 1. This is the first release of this unit of competency in the UEP Generation Training Package.

Application

This unit involves the skills and knowledge required to operate, inspect and monitor fuel supply from source to recipient unit storage.

A fuel system will consist of a variety of plant and equipment that requires regular monitoring to ensure smooth operations are maintained in the fuel delivery process.

Competency in this unit requires the ability to plan work, operate fuel supply plant, test fuel supply plant, analyse fuel supply plant faults, monitor and inspect fuel supply plant and the completion of all documentation. Individuals will, in general, work under supervision, in a power generation facility, as a fuel operator.

Power generation plant operators are typically trained and authorised to isolate, prepare plant and issue permits to work.

No licensing, legislative or certification requirements apply to this unit at the time of publication.

Note: Workplace practice

The application of the skills and knowledge described in this unit may require a licence or training permit to practice in the workplace where work is carried out on gas and electrical installations. Additional conditions may apply under state and territory legislative and regulatory licensing requirements.

Pre-requisite Unit

There are no prerequisite units.

Competency Field

Operations

Unit Sector

Electricity generation

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Elements and Performance Criteria

ELEMENTS	PERFORMANCE CRITERIA
Elements describe the essential outcomes.	Performance criteria describe the performance needed to demonstrate achievement of the element.
1 Plan and prepare work	**1.1** Safety issues related to operating and monitoring fuel supply plant are identified, in accordance with workplace procedures and Work, Health and Safety (WHS)/Occupational Health and Safety (OHS) regulations and legislative requirements
	1.2 Work requirements are identified, in accordance with workplace procedures, from appropriate personnel and documentation
	1.3 Documentation to determine fuel supply plant status is assessed and evaluated, in accordance with workplace procedures
	1.4 Inspection and field preparation for fuel supply plant service are carried out, in accordance with workplace procedures and manufacturers' recommendations
	1.5 Fuel supply plant operational prerequisites are established, in accordance with workplace procedures and manufacturers' recommendations
	1.6 Sequence for recommissioning of fuel supply plant is determined to suit existing circumstances, in accordance with workplace procedures and site requirements
2 Operate fuel supply plant	**2.1** Fuel supply plant is operated, in accordance with workplace and manufacturers' operating procedures
	2.2 Fuel supply plant is monitored to detect deviations from normal operating conditions, in accordance with workplace procedures
	2.3 Corrective actions are taken to rectify fuel supply plant abnormalities, in accordance with industry standards and workplace and manufacturers' procedures
3 Test fuel supply plant operation	**3.1** Operational tests are performed, in accordance with workplace procedures
	3.2 Fuel supply plant is observed, in accordance with workplace procedures for correct operational response

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	3.3	Corrective action is taken, in accordance with workplace procedures, when response does not meet with documentation, fuel supply plant integrity or personnel safety requirements
	3.4	Fuel supply plant is returned to required operational status upon completion of test, in accordance with workplace procedures
4 Analyse fuel supply plant faults	**4.1**	Causes of abnormal fuel supply plant operating conditions are identified, in accordance with workplace procedures, and by analysing technical and operational information
	4.2	Corrective action is taken, in accordance with workplace procedures
	4.3	Fuel supply plant integrity and personnel safety are maintained, in accordance with workplace procedures, and in consultation with appropriate personnel and technical and operational documentation
5 Monitor and inspect fuel supply plant	**5.1**	Fuel supply plant to be monitored and inspected is physically identified, in accordance with workplace procedures
	5.2	Fuel supply plant is monitored and inspected, in accordance with workplace procedures for normal operation or to detect deviations
	5.3	Corrective action is taken, in accordance with workplace procedures
	5.4	Appropriate personnel are notified, in accordance with workplace procedures when defects are detected
6 Complete documentation	**6.1**	Fuel supply plant problems, movements, abnormalities and status are reported, in accordance with workplace procedures
	6.2	Documentation is updated, in accordance with workplace procedures

Foundation Skills

Foundation skills essential to performance are explicit in the performance criteria of this unit of competency.

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Range of Conditions

Range is restricted to essential operating conditions and any other variables essential to the work environment.

Non-essential conditions may be found in the Companion Volume Implementation Guide.

Unit Mapping Information

This unit replaces and is equivalent to UEPOPS312B Operate and monitor fuel supply.

Links

Companion Volume implementation guides are found in VETNet - https://vetnet.gov.au/Pages/TrainingDocs.aspx?q=1715b9fa-e7bd-441c-bb8d-cf22c9c825a8

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Assessment Requirements for UEPOPS312 Operate and monitor fuel supply

Modification History

Release 1. This is the first release of this unit of competency in the UEP Generation Training Package.

Performance Evidence

Evidence required to demonstrate competence in this unit must be relevant to and satisfy all the requirements of the elements, performance criteria and range of conditions on at least two separate occasions and includes:

- analysing plant faults using data analysis techniques and tools
- applying Work, Health and Safety (WHS)/Occupational Health and Safety (OHS) requirements including
  - emergency procedures
  - risk control measures
  - safe working practices
- communicating with personnel
- completing documentation using recording procedures
- identifying fuel supply plant status
- implementing legislation, industry standards, codes of practice and regulations
- interpreting specifications and manufacturers' manuals
- monitoring and inspecting plant operations
- operating fuel supply plant
- organising resources
- planning and preparing work
- preparing fuel supply plant and/or equipment for operation
- recognising and responding to abnormal fuel supply plant operating conditions and faults
- testing plant operationally using diagnostic and test techniques
- working with permit to work system

Knowledge Evidence

Evidence required to demonstrate competence in this unit must be relevant to and satisfy all the requirements of the elements, performance criteria and range of conditions and includes knowledge of:

- fuel supply plant and equipment, its location and operating parameters
- fuel supply plant status

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- legislation, industry standards, codes of practice and regulations
- manufacturers' specifications and manuals
- permit to work system
- typical arrangements of power production plant
- WHS/OHS legislated requirements including:
  - emergency procedures
  - safe working practices
  - risk control measures
- workplace documentation
- workplace policies and procedures

Assessment Conditions

As a minimum, assessors must satisfy applicable regulatory requirements, which include requirements in the Standards for Registered Training Organisations current at the time of assessment.

As a minimum, assessment must satisfy applicable regulatory requirements, which include requirements in the Standards for Registered Training Organisations current at the time of assessment.

Assessment processes and techniques must be appropriate to the language, literacy and numeracy requirements of the work being performed and the needs of the candidate.

Assessment must occur in workplace operational situations. Where this is not appropriate, assessment must occur in simulated workplace operational situations that reflect workplace conditions.

Resources for assessment must include access to:

- a range of relevant exercises, case studies and/or other simulations
- relevant and appropriate materials, tools, equipment and personal protective equipment currently used in industry
- applicable documentation including workplace procedures, industry standards, equipment specifications, regulations, codes of practice and operation manuals.

Links

Companion Volume implementation guides are found in VETNet - https://vetnet.gov.au/Pages/TrainingDocs.aspx?q=1715b9fa-e7bd-441c-bb8d-cf22c9c825a8

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UEPOPS313 Operate and monitor boiler draught system

Modification History

Release 1. This is the first release of this unit of competency in the UEP Generation Training Package.

Application

This unit involves the skills and knowledge required to operate, inspect and monitor boiler draught equipment.

Boiler draught is defined as the difference between atmospheric pressure and the pressure existing in a furnace or the flue gas passage of a boiler. Boiler draught is important to the smooth operation of all the systems in a power generating facility.

Competency in this unit requires the ability to plan work, operate boiler draught system plant, test boiler draught system plant, analyse boiler draught system plant faults, monitor and inspect boiler draught system plant and complete all documentation. Individuals will, in general, work under supervision, in a power generation facility as an operator.

Power generation plant operators are typically trained and authorised to isolate, prepare plant and issue permits to work.

No licensing, legislative or certification requirements apply to this unit at the time of publication.

Note: Workplace practice

The application of the skills and knowledge described in this unit may require a licence or training permit to practice in the workplace where work is carried out on gas and electrical installations. Additional conditions may apply under state and territory legislative and regulatory licensing requirements.

Pre-requisite Unit

There are no prerequisite units.

Competency Field

Operations

Unit Sector

Electricity generation

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Elements and Performance Criteria

ELEMENTS	PERFORMANCE CRITERIA
Elements describe the essential outcomes.	Performance criteria describe the performance needed to demonstrate achievement of the element.
1 Plan and prepare for boiler draught system operation	**1.1** Safety issues related to operating and monitoring boiler draught system plant are identified, in accordance with workplace procedures and Work, Health and Safety (WHS)/Occupational Health and Safety (OHS) regulations and legislative requirements
	1.2 Work requirements including work to permit are identified, in accordance with workplace procedures, from appropriate personnel and documentation
	1.3 Documentation to determine boiler draught system plant status is assessed and evaluated, in accordance with workplace procedures
	1.4 Inspection, preoperational checks and field preparations for boiler draught system plant service are carried out, in accordance with workplace procedures and manufacturers' recommendations
	1.5 Boiler draught system plant operational prerequisites are established, in accordance with workplace procedures and manufacturers' recommendations
	1.6 Sequence for recommissioning of boiler draught system plant is determined to suit existing circumstances in accordance with workplace procedures and site requirements
2 Operate boiler draught system plant	**2.1** Boiler draught system plant is operated, in accordance with workplace procedures and manufacturers' operating recommendations
	2.2 Boiler draught system plant is monitored and observed, in accordance with workplace procedures, to detect deviations from normal operating conditions
	2.3 Corrective actions are taken to rectify abnormalities, in accordance with workplace procedures, industry standards and site requirements
3 Test plant boiler draught system operation	**3.1** Operational tests are performed, in accordance with workplace procedures

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	3.2	Boiler draught system plant is observed for correct operational response, in accordance with workplace procedures
	3.3	Corrective action is taken, in accordance with workplace procedures, when response does not meet with documentation, boiler draught system plant integrity or personnel safety requirements
	3.4	Boiler draught system plant is returned to required operational status upon completion of testing, in accordance with workplace procedures
4 Analyse boiler draught system plant faults	**4.1**	Causes of abnormal boiler draught system plant operating conditions are identified, in accordance with workplace procedures, by analysing technical and operational information
	4.2	Corrective action is taken, in accordance with workplace procedures
	4.3	Boiler draught system plant integrity and personnel safety is maintained, in accordance with workplace procedures, and in consultation with appropriate personnel and technical and operational documentation
5 Monitor and inspect boiler draught system plant	**5.1**	Boiler draught system plant to be monitored and/or inspected is physically identified, in accordance with workplace procedures
	5.2	Boiler draught system plant is monitored and/or inspected, in accordance with workplace procedures, for normal operation or to detect deviations
	5.3	Corrective action is taken, in accordance with workplace procedures
	5.4	Appropriate personnel are notified, in accordance with workplace procedures, when defects are detected
6 Complete documentation	**6.1**	Boiler draught system plant problems, movements and status are reported, in accordance with workplace procedures
	6.2	Documentation is updated, in accordance with workplace procedures

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Foundation Skills

Foundation skills essential to performance are explicit in the performance criteria of this unit of competency.

Range of Conditions

Range is restricted to essential operating conditions and any other variables essential to the work environment.

Non-essential conditions may be found in the Companion Volume Implementation Guide.

Unit Mapping Information

This unit replaces and is equivalent to UEPOPS313B Operate and monitor boiler draught system.

Links

Companion Volume implementation guides are found in VETNet - https://vetnet.gov.au/Pages/TrainingDocs.aspx?q=1715b9fa-e7bd-441c-bb8d-cf22c9c825a8

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Assessment Requirements for UEPOPS313 Operate and monitor boiler draught system

Modification History

Release 1. This is the first release of this unit of competency in the UEP Generation Training Package.

Performance Evidence

Evidence required to demonstrate competence in this unit must be relevant to and satisfy all the requirements of the elements, performance criteria and range of conditions on at least two separate occasions and includes:

- analysing boiler draught system plant to identify and respond to abnormal boiler draught system plant operating conditions
- applying Work, Health and Safety (WHS)/Occupational Health and Safety (OHS) requirements including
  - emergency procedures
  - safe working practices
  - risk control measures
- communicating with personnel
- completing documentation
- executing corrective actions for faults
- identifying boiler draught system plant faults using data analysis techniques and tools
- identifying boiler draught system plant status
- implementing legislation, industry standards, codes of practice and regulations
- interpreting manufacturers' specifications, drawings and manuals
- isolating boiler draught system
- monitoring and inspecting boiler draught system plant operation including combustion, fans, air flow and control
- operating boiler draught system plant
- organising resources
- preparing boiler draught system plant and/or equipment for operation and planning work
- testing boiler draught system plant operation using diagnostic and test techniques
- using permit to work system

Knowledge Evidence

Evidence required to demonstrate competence in this unit must be relevant to and satisfy all the requirements of the elements, performance criteria and range of conditions and includes knowledge of:

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- boiler draught system plant and equipment, its location and operating parameters including combustion, fans, air flow and control
- boiler draught system plant status
- isolations requirements
- legislation, industry standards, codes of practice and regulations
- manufacturers' specifications, drawings and manuals
- permit to work system
- typical arrangements of power production plant
- typical boiler draught system faults and corrective actions
- WHS/OHS legislated requirements including:
  - emergency procedures
  - risk control measures
  - safe working practices
- workplace documentation
- workplace policies and procedures

Assessment Conditions

As a minimum, assessors must satisfy applicable regulatory requirements, which include requirements in the Standards for Registered Training Organisations current at the time of assessment.

As a minimum, assessment must satisfy applicable regulatory requirements, which include requirements in the Standards for Registered Training Organisations current at the time of assessment.

Assessment processes and techniques must be appropriate to the language, literacy and numeracy requirements of the work being performed and the needs of the candidate.

Assessment must occur in workplace operational situations. Where this is not appropriate, assessment must occur in simulated workplace operational situations that reflect workplace conditions.

Resources for assessment must include access to:

- a range of relevant exercises, case studies and/or other simulations
- relevant and appropriate materials, tools, equipment and personal protective equipment currently used in industry
- applicable documentation including workplace procedures, industry standards, equipment specifications, regulations, codes of practice and operation manuals.

Links

Companion Volume implementation guides are found in VETNet - https://vetnet.gov.au/Pages/TrainingDocs.aspx?q=1715b9fa-e7bd-441c-bb8d-cf22c9c825a8

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UEPOPS314 Operate and monitor fuel firing plant (gas or oil)

Modification History

Release 1. This is the first release of this unit of competency in the UEP Generation Training Package.

Application

This unit involves the skills and knowledge required to operate, inspect and monitor fuel firing plant (gas or oil).

Regular inspections and monitoring of fuel firing plant is required to ensure the safe operation of gas and/or oil firing systems.

Competency in this unit requires the ability to plan work, operate fuel firing (gas or oil) plant, test fuel firing plant, analyse fuel firing plant faults, monitor and inspect fuel firing plant and the completion of all documentation. Individuals will, in general, work under supervision, in a power generation facility as an operator.

Power generation plant operators are typically trained and authorised to isolate, prepare plant and issue permits to work.

No licensing, legislative or certification requirements apply to this unit at the time of publication.

Note: Workplace practice

The application of the skills and knowledge described in this unit may require a licence or training permit to practice in the workplace where work is carried out on gas and electrical installations. Additional conditions may apply under state and territory legislative and regulatory licensing requirements.

Pre-requisite Unit

There are no prerequisite units.

Competency Field

Operations

Unit Sector

Electricity generation

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Elements and Performance Criteria

ELEMENTS	PERFORMANCE CRITERIA
Elements describe the essential outcomes.	Performance criteria describe the performance needed to demonstrate achievement of the element.
1 Plan and prepare work	**1.1** Safety issues related to operating and monitoring fuel firing plant are identified, in accordance with workplace procedures and Work, Health and Safety (WHS)/Occupational Health and Safety (OHS) regulations and legislative requirements
	1.2 Work requirements are identified, in accordance with workplace procedures, from relevant personnel and documentation
	1.3 Documentation to determine fuel firing plant status is assessed and evaluated, in accordance with workplace procedures
	1.4 Inspection, preoperational tests and field preparations for fuel firing plant service are carried out, in accordance with workplace procedures and manufacturers' recommendations
	1.5 Fuel firing plant operational prerequisites are established, in accordance with workplace procedures and manufacturers' recommendations
	1.6 Sequence for recommissioning of fuel firing plant is determined, in accordance with workplace procedures and site requirements
2 Operate fuel firing plant	**2.1** Fuel firing plant is operated, in accordance with workplace procedures and manufacturers' operating recommendations
	2.2 Fuel firing plant is monitored and observed, in accordance with workplace procedures, to detect deviations from normal operating conditions
	2.3 Corrective actions are taken to rectify fuel firing plant abnormalities, in accordance with workplace procedures and manufacturers' recommendations
3 Test fuel firing plant operation	**3.1** Operational tests are performed, in accordance with workplace procedures

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	3.2	Fuel firing plant is observed, in accordance with workplace procedures, for correct operational response
	3.3	Corrective action is taken, in accordance with workplace procedures, when response does not meet with documentation, fuel firing plant integrity or personnel safety requirements
	3.4	Fuel firing plant is returned to required operational status upon completion of test, in accordance with workplace procedures
4 Analyse fuel firing plant faults	**4.1**	Causes of abnormal fuel firing plant operating conditions are identified, in accordance with workplace procedures, and by analysing technical and operational information
	4.2	Corrective action is taken, in accordance with workplace procedures
	4.3	Fuel firing plant integrity and personnel safety is maintained, in accordance with workplace procedures, and in consultation with appropriate personnel and technical and operational documentation
5 Monitor and inspect fuel firing plant	**5.1**	Fuel firing plant to be monitored and inspected is physically identified, in accordance with workplace procedures
	5.2	Fuel firing plant is monitored and inspected for normal operation or to detect deviations, in accordance with workplace procedures
	5.3	Corrective action is taken, in accordance with workplace procedures
	5.4	Appropriate personnel are notified when defects are detected, in accordance with workplace procedures
6 Complete documentation	**6.1**	Fuel firing plant problems, movements, and status are reported, in accordance with workplace procedures
	6.2	Documentation is updated, in accordance with workplace procedures

Foundation Skills

Foundation skills essential to performance are explicit in the performance criteria of this unit of

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competency.

Range of Conditions

Range is restricted to essential operating conditions and any other variables essential to the work environment.

Non-essential conditions may be found in the Companion Volume Implementation Guide.

Unit Mapping Information

This unit replaces and is equivalent to UEPOPS314B Operate and monitor fuel firing plant (gas or oil).

Links

Companion Volume implementation guides are found in VETNet - https://vetnet.gov.au/Pages/TrainingDocs.aspx?q=1715b9fa-e7bd-441c-bb8d-cf22c9c825a8

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Assessment Requirements for UEPOPS314 Operate and monitor fuel firing plant (gas or oil)

Modification History

Release 1. This is the first release of this unit of competency in the UEP Generation Training Package.

Performance Evidence

Evidence required to demonstrate competence in this unit must be relevant to and satisfy all the requirements of the elements, performance criteria and range of conditions on at least two separate occasions and includes:

- analysing fuel firing plant faults including identifying and responding to abnormal fuel firing plant operating conditions
- analysing fuel firing plant faults using data analysis techniques and tools
- applying Work, Health and Safety (WHS)/Occupational Health and Safety (OHS) requirements including:
  - emergency procedures
  - risk control measures
  - safe working practices
- communicating with personnel
- completing documentation including using recording procedures
- identifying fuel firing plant status
- implementing legislation, industry standards, codes of practice and regulations
- interpreting manufacturers' specifications and manuals
- monitoring and inspecting fuel firing plant operations
- operating fuel firing plant
- organising resources
- preparing and planning work
- preparing fuel firing plant and/or equipment for operation
- testing fuel firing plant operationally using diagnostic and test techniques
- working with permit to work system

Knowledge Evidence

Evidence required to demonstrate competence in this unit must be relevant to and satisfy all the requirements of the elements, performance criteria and range of conditions and includes knowledge of:

- fuel firing plant (gas or oil) plant and equipment, its location and operating parameters
- fuel firing plant (gas or oil) status

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- legislation, industry standards, codes of practice, regulations
- manufacturers' specifications and manuals
- permit to work system
- typical arrangements of power production plant
- WHS/OHS legislated requirements including:
  - emergency procedures
  - risk control measures
  - safe working practices
- workplace documentation
- workplace policies and procedures

Assessment Conditions

As a minimum, assessors must satisfy applicable regulatory requirements, which include requirements in the Standards for Registered Training Organisations current at the time of assessment.

As a minimum, assessment must satisfy applicable regulatory requirements, which include requirements in the Standards for Registered Training Organisations current at the time of assessment.

Assessment processes and techniques must be appropriate to the language, literacy and numeracy requirements of the work being performed and the needs of the candidate.

Assessment must occur in workplace operational situations. Where this is not appropriate, assessment must occur in simulated workplace operational situations that reflect workplace conditions.

Resources for assessment must include access to:

- a range of relevant exercises, case studies and/or other simulations
- relevant and appropriate materials, tools, equipment and personal protective equipment currently used in industry
- applicable documentation including workplace procedures, industry standards, equipment specifications, regulations, codes of practice and operation manuals.

Links

Companion Volume implementation guides are found in VETNet - https://vetnet.gov.au/Pages/TrainingDocs.aspx?q=1715b9fa-e7bd-441c-bb8d-cf22c9c825a8

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UEPOPS315 Operate and monitor fuel firing plant (coal)

Modification History

Release 1. This is the first release of this unit of competency in the UEP Generation Training Package.

Application

This unit involves the skills and knowledge required to operate, inspect and monitor fuel firing plant (coal).

Regular inspections and monitoring of fuel firing plant is required to ensure the safe operation of coal firing system.

Competency in this unit requires the ability to plan work, operate fuel firing (coal) plant, test fuel firing plant, analyse fuel firing plant faults, monitor and inspect fuel firing plant and complete all documentation. Individuals will, in general, work under supervision, in a power generation facility as an operator.

Power generation plant operators are typically trained and authorised to isolate, prepare plant and issue permits to work.

No licensing, legislative or certification requirements apply to this unit at the time of publication.

Note: Workplace practice

The application of the skills and knowledge described in this unit may require a licence or training permit to practice in the workplace where work is carried out on gas and electrical installations. Additional conditions may apply under state and territory legislative and regulatory licensing requirements.

Pre-requisite Unit

There are no prerequisite units.

Competency Field

Operations

Unit Sector

Electricity generation

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Elements and Performance Criteria

ELEMENTS	PERFORMANCE CRITERIA
Elements describe the essential outcomes.	Performance criteria describe the performance needed to demonstrate achievement of the element.
1 Plan and prepare for fuel firing plant operation	**1.1** Safety issues related to operating and monitoring fuel firing are identified, in accordance with workplace procedures and Work, Health and Safety (WHS)/Occupational Health and Safety (OHS) regulations and legislative requirements
	1.2 Work requirements including work to permit are identified, in accordance with workplace procedures, from relevant personnel and documentation
	1.3 Documentation to determine fuel firing plant status is assessed and evaluated, in accordance with workplace procedures
	1.4 Inspection, preoperational tests and field preparations for fuel firing plant service are carried out in accordance with workplace procedures and manufacturers' recommendations
	1.5 Fuel firing plant operational prerequisites are established, in accordance with workplace procedures and manufacturers' recommendations
	1.6 Sequence for recommissioning of fuel firing plant is determined, in accordance with workplace procedures and site requirements
2 Operate fuel firing plant	**2.1** Fuel firing plant is operated, in accordance with workplace and manufacturers' operating procedures
	2.2 Fuel firing plant is monitored and observed to detect deviations from normal operating conditions, in accordance with workplace procedures
	2.3 Corrective actions are taken to rectify fuel firing plant abnormalities, in accordance with workplace and manufacturers' procedures
3 Test fuel firing plant operation	**3.1** Operational tests are performed, in accordance with workplace procedures
	3.2 Fuel firing plant is observed for correct operational

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		response, in accordance with workplace procedures
	3.3	Corrective action is taken, in accordance with workplace procedures, when response does not meet with documentation, fuel firing plant integrity or personnel safety requirements
	3.4	Fuel firing plant is returned to required operational status upon completion of test, in accordance with workplace procedures
4 Analyse fuel firing plant faults	**4.1**	Causes of abnormal fuel firing plant operating conditions are identified, in accordance with workplace procedures, and by analysing technical and operational information
	4.2	Corrective action is taken, in accordance with workplace procedures
	4.3	Fuel firing plant integrity and personnel safety is maintained, in accordance with workplace procedures and in consultation with appropriate personnel and technical and operational documentation
5 Monitor and inspect fuel firing plant	**5.1**	Fuel firing plant to be monitored and/or inspected is physically identified, in accordance with workplace procedures
	5.2	Fuel firing plant is monitored and/or inspected, in accordance with workplace procedures, for normal operation or to detect deviations
	5.3	Corrective action is taken, in accordance with workplace procedures
	5.4	Appropriate personnel are notified, in accordance with workplace procedures, when defects are detected
6 Complete documentation	**6.1**	Fuel firing plant problems, movements and status are reported, in accordance with workplace procedures
	6.2	Documentation is updated, in accordance with workplace procedures

Foundation Skills

Foundation skills essential to performance are explicit in the performance criteria of this unit of competency.

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Range of Conditions

Range is restricted to essential operating conditions and any other variables essential to the work environment.

Non-essential conditions may be found in the Companion Volume Implementation Guide.

Unit Mapping Information

This unit replaces and is equivalent to UEPOPS315B Operate and monitor fuel firing plant (coal).

Links

Companion Volume implementation guides are found in VETNet - https://vetnet.gov.au/Pages/TrainingDocs.aspx?q=1715b9fa-e7bd-441c-bb8d-cf22c9c825a8

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Assessment Requirements for UEPOPS315 Operate and monitor fuel firing plant (coal)

Modification History

Release 1. This is the first release of this unit of competency in the UEP Generation Training Package.

Performance Evidence

Evidence required to demonstrate competence in this unit must be relevant to and satisfy all the requirements of the elements, performance criteria and range of conditions on at least two separate occasions and includes:

- analysing fuel firing plant faults using data analysis techniques and tools
- applying Work, Health and Safety (WHS)/Occupational Health and Safety (OHS) requirements including:
  - emergency procedures
  - risk control measures
  - safe work practices
- communicating with personnel
- completing documentation using recording procedures
- identifying fuel firing (coal) plant status
- implementing legislation, industry standards, codes of practice and regulations
- interpreting manufacturers specifications and manuals
- isolating fuel firing plant
- monitoring and inspecting plant operation
- operating fuel firing plant
- organising resources
- preparing and planning work
- recognising and responding to abnormal plant operating conditions
- testing fuel firing plant operation using diagnostic and test techniques
- using permit to work system
- working with fuel firing plant or equipment

Knowledge Evidence

Evidence required to demonstrate competence in this unit must be relevant to and satisfy all the requirements of the elements, performance criteria and range of conditions and includes knowledge of:

- fuel firing plant and equipment, its location and operating parameters

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- fuel firing plant faults and corrective actions
- fuel firing plant status
- isolation requirements
- legislation, industry standards, codes of practice and regulations
- manufacturers' specifications and manuals
- permit to work system
- typical arrangements of power production plant
- WHS/OHS legislated requirements including:
  - emergency procedures
  - risk control measures
  - safe work practices
- workplace documentation
- workplace policies and procedures

Assessment Conditions

As a minimum, assessors must satisfy applicable regulatory requirements, which include requirements in the Standards for Registered Training Organisations current at the time of assessment.

As a minimum, assessment must satisfy applicable regulatory requirements, which include requirements in the Standards for Registered Training Organisations current at the time of assessment.

Assessment processes and techniques must be appropriate to the language, literacy and numeracy requirements of the work being performed and the needs of the candidate.

Assessment must occur in workplace operational situations. Where this is not appropriate, assessment must occur in simulated workplace operational situations that reflect workplace conditions.

Resources for assessment must include access to:

- a range of relevant exercises, case studies and/or other simulations
- relevant and appropriate materials, tools, equipment and personal protective equipment currently used in industry
- applicable documentation including workplace procedures, industry standards, equipment specifications, regulations, codes of practice and operation manuals.

Links

Companion Volume implementation guides are found in VETNet - https://vetnet.gov.au/Pages/TrainingDocs.aspx?q=1715b9fa-e7bd-441c-bb8d-cf22c9c825a8

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UEPOPS316 Operate and monitor boiler steam/water cycle

Modification History

Release 1. This is the first release of this unit of competency in the UEP Generation Training Package.

Application

This unit involves the skills and knowledge required to operate, inspect and monitor a boiler steam and/or water cycle.

The relationship of components within the boiler and steam and/or water cycle in a power generating unit system, and the effect of adjustments made to components, can impact the efficiency and safety of a power generating facility's operation.

Competency in this unit requires the ability to plan work, operate boiler steam and/or water cycle plant, test boiler steam and/or water cycle plant, analyse boiler steam and/or water cycle plant faults, monitor and inspect boiler steam and/or water cycle plant and the completion of all documentation. Individuals will, in general, work under supervision, in a power generation facility as an operator.

Power generation plant operators are typically trained and authorised to isolate, prepare plant and issue permits to work.

No licensing, legislative or certification requirements apply to this unit at the time of publication.

Note: Workplace practices

The application of the skills and knowledge described in this unit may require a licence or training permit to practice in the workplace where work is carried out on gas and electrical installations. Additional conditions may apply under state and territory legislative and regulatory licensing requirements.

Pre-requisite Unit

There are no prerequisites units.

Competency Field

Operations

Unit Sector

Electricity generation

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Elements and Performance Criteria

ELEMENTS	PERFORMANCE CRITERIA
Elements describe the essential outcomes.	Performance criteria describe the performance needed to demonstrate achievement of the element.
1 Plan and prepare for boiler steam water cycle operation	**1.1** Safety issues related to operating and monitoring boiler steam and water cycle plant are identified, in accordance with workplace procedures and Work, Health and Safety (WHS)/Occupational Health and Safety (OHS) regulations and legislative requirements
	1.2 Work requirements, including permits to work, are identified, in accordance with workplace procedures, from appropriate personnel and documentation
	1.3 Documentation to determine boiler steam and water cycle plant status is assessed and evaluated, in accordance with workplace procedures
	1.4 Inspection, preoperational checks and field preparations for boiler steam and water cycle service are carried out, in accordance with workplace procedures and manufacturers' recommendations
	1.5 Boiler steam and water cycle plant operational prerequisites are established, in accordance with workplace procedures and manufacturers' recommendations
	1.6 Sequence for recommissioning of boiler steam and water cycle plant is determined, in accordance with workplace procedures and site requirements
2 Operate boiler steam/water cycle plant	**2.1** Boiler steam and water cycle plant is operated, in accordance with workplace procedures and manufacturers' operating recommendations
	2.2 Boiler steam and water cycle plant is monitored and observed, in accordance with workplace procedures, to detect deviations from normal operating conditions
	2.3 Corrective actions are taken to rectify abnormalities, in accordance with workplace procedures and industry standards
	2.4 Boiler steam and water cycle plant is identified and removed from service, in accordance with workplace

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		procedures
	2.5	Corrective actions are taken, in accordance with workplace procedures when boiler steam and water cycle plant abnormalities are identified during removal from service
3 Test boiler steam/water cycle plant operation	**3.1**	Operational tests are performed, in accordance with workplace procedures
	3.2	Boiler steam and water cycle plant is observed for correct operational response, in accordance with workplace procedures
	3.3	Corrective action is taken, in accordance with workplace procedures, when response does not meet with documentation, boiler steam and water cycle plant integrity or personnel safety requirements
	3.4	Boiler steam and water cycle plant is returned to required operational status upon completion of testing, in accordance with workplace procedures
4 Analyse boiler steam/water cycle plant faults	**4.1**	Causes of abnormal boiler steam and water cycle plant operating conditions are identified, in accordance with workplace procedures, and by analysing technical and operational information
	4.2	Corrective action is taken, in accordance with workplace procedures
	4.3	Boiler steam and water cycle plant integrity and personnel safety are maintained, in accordance with workplace procedures, and in consultation with appropriate personnel and technical and operational documentation
5 Monitor and inspect boiler steam/water cycle plant	**5.1**	Boiler steam and water cycle plant to be monitored and inspected is physically identified, in accordance with workplace procedures
	5.2	Boiler steam and water cycle plant is monitored and inspected, in accordance with workplace procedures for normal operation or to detect deviations
	5.3	Corrective action is taken, in accordance with workplace procedures
	5.4	Appropriate personnel are notified, in accordance with

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		workplace procedures, when defects are detected
6 Complete documentation	**6.1**	Boiler steam and water cycle plant problems, movements, abnormalities and status are reported, in accordance with workplace procedures
	6.2	Documentation is updated, in accordance with workplace procedures

Foundation Skills

Foundation skills essential to performance are explicit in the performance criteria of this unit of competency.

Range of Conditions

Range is restricted to essential operating conditions and any other variables essential to the work environment.

Non-essential conditions may be found in the Companion Volume Implementation Guide.

Unit Mapping Information

This unit replaces and is equivalent to UEPOPS316B Operate and monitor boiler steam/water cycle.

Links

Companion Volume implementation guides are found in VETNet - https://vetnet.gov.au/Pages/TrainingDocs.aspx?q=1715b9fa-e7bd-441c-bb8d-cf22c9c825a8

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Assessment Requirements for UEPOPS316 Operate and monitor boiler steam/water cycle

Modification History

Release 1. This is the first release of this unit of competency in the UEP Generation Training Package.

Performance Evidence

Evidence required to demonstrate competence in this unit must be relevant to and satisfy all the requirements of the elements, performance criteria and range of conditions on at least two separate occasions and includes:

- analysing boiler water and/or steam cycle plant faults using data analysis techniques and tools
- applying Work, Health and Safety (WHS)/Occupational Health and Safety (OHS) requirements including:
  - emergency procedures
  - risk control measures
  - safe work practices
- communicating with personnel
- completing documentation using recording procedures
- identifying boiler water and/or steam cycle plant status
- implementing legislation, industry standards, codes of practice and regulations
- interpreting manufacturers' specifications and manuals
- monitoring and inspecting boiler water and/or steam cycle plant operations
- operating boiler water and/or steam cycle plant
- organising resources
- performing isolations
- preparing and planning work
- preparing boiler water and/or steam cycle plant and/or equipment for operation
- recognising and responding to abnormal boiler water and/or steam cycle plant operating conditions
- testing boiler water and/or steam cycle plant operationally using diagnostic and test techniques
- using permit to work system

Knowledge Evidence

Evidence required to demonstrate competence in this unit must be relevant to and satisfy all the requirements of the elements, performance criteria and range of conditions and includes

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knowledge of:

- boiler steam and/or water systems, types and characteristics including steam temperature controls, economisers and superheaters
- boiler water and/or steam cycle plant and equipment, its location and operating parameters
- boiler water and/or steam cycle plant status
- isolations
- legislation, industry standards, codes of practice and regulations
- manufacturers' specifications and manuals
- permit to work system
- typical arrangements of power production plant
- WHS/OHS legislated requirements including:
  - emergency procedures
  - risk control measures
  - safe work practices
- workplace documentation
- workplace policies and procedures

Assessment Conditions

As a minimum, assessors must satisfy applicable regulatory requirements, which include requirements in the Standards for Registered Training Organisations current at the time of assessment.

As a minimum, assessment must satisfy applicable regulatory requirements, which include requirements in the Standards for Registered Training Organisations current at the time of assessment.

Assessment processes and techniques must be appropriate to the language, literacy and numeracy requirements of the work being performed and the needs of the candidate.

Assessment must occur in workplace operational situations. Where this is not appropriate, assessment must occur in simulated workplace operational situations that reflect workplace conditions.

Resources for assessment must include access to:

- a range of relevant exercises, case studies and/or other simulations
- relevant and appropriate materials, tools, equipment and personal protective equipment currently used in industry
- applicable documentation including workplace procedures, industry standards, equipment specifications, regulations, codes of practice and operation manuals

Links

Companion Volume implementation guides are found in VETNet - https://vetnet.gov.au/Pages/TrainingDocs.aspx?q=1715b9fa-e7bd-441c-bb8d-cf22c9c825a8

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UEPOPS317 Operate and monitor fixed fire protection systems

Modification History

Release 1. This is the first release of this unit of competency in the UEP Generation Training Package.

Application

This unit involves the skills and knowledge required to operate, inspect and monitor fixed fire protection systems.

Fixed fire protection systems are engineered sets of components that work together to detect fires, alert occupants and extinguish fires. Fixed fire protection systems use a combination of dry chemicals and wet agents to suppress fires.

Competency in this unit requires the ability to plan work, operate fixed fire protection system plant, test fixed fire protection system plant, analyse fixed fire protection system plant faults, monitor and inspect fixed fire protection system plant and the completion of all documentation. Individuals will, in general, work under supervision, in a power generating facility as a fire systems operator.

Power generation plant operators are typically trained and authorised to isolate, prepare plant and issue permits to work.

No licensing, legislative or certification requirements apply to this unit at the time of publication.

Note: Workplace practice

The application of the skills and knowledge described in this unit may require a licence or training permit to practice in the workplace where work is carried out on gas and electrical installations. Additional conditions may apply under state and territory legislative and regulatory licensing requirements.

Pre-requisite Unit

There are no prerequisite units.

Competency Field

Operations

Unit Sector

Electricity generation

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Elements and Performance Criteria

ELEMENTS	PERFORMANCE CRITERIA
Elements describe the essential outcomes.	Performance criteria describe the performance needed to demonstrate achievement of the element.
1 Plan and prepare work	**1.1** Safety issues related to operating and monitoring fixed fire protection system plant are identified, in accordance with workplace procedures and Work, Health and Safety (WHS)/Occupational Health and Safety (OHS) regulations and legislative requirements
	1.2 Work requirements are identified, in accordance with workplace procedures, from appropriate personnel and documentation
	1.3 Documentation to determine fixed fire protection system plant status is assessed and evaluated, in accordance with workplace procedures
	1.4 Inspection and field preparations for fixed fire protection system plant service are carried out, in accordance with workplace procedures and manufacturers' recommendations
	1.5 Fixed fire protection system plant operational prerequisites are established, in accordance with workplace procedures and manufacturers' recommendations
	1.6 Sequence for recommissioning of fixed fire protection system plant is determined, in accordance with workplace procedures and site requirements
2 Operate fixed fire protection system plant	**2.1** Fixed fire protection system plant is operated, in accordance with workplace procedures and manufacturers' operating recommendations
	2.2 Fixed fire protection system plant is monitored and observed, in accordance with workplace procedures, to detect deviations from normal operating conditions
	2.3 Corrective actions are taken to rectify fixed fire protection system plant abnormalities, in accordance with workplace procedures and manufacturers' recommendations
3 Test fixed fire protection	**3.1** Operational tests are performed, in accordance with

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system plant operation		workplace procedures
	3.2	Fixed fire protection system plant is observed for correct operational response, in accordance with workplace procedures and manufacturers' recommendations
	3.3	Corrective action is taken, in accordance with workplace procedures
	3.4	Fixed fire protection system plant is returned to required operational status upon completion of testing, in accordance with workplace procedures
4 Analyse fixed fire protection system plant faults	**4.1**	Causes of abnormal fixed fire protection systems plant operating conditions are identified, in accordance with workplace procedures, and by analysing technical and operational information
	4.2	Corrective action is taken, in accordance with workplace procedures
	4.3	Fixed fire protection system plant integrity and personnel safety are maintained, in accordance with workplace procedures, and in consultation with appropriate personnel and technical and operational documentation
5 Monitor and inspect fixed fire protection system plant	**5.1**	Fixed fire protection system plant to be monitored and/or inspected is physically identified, in accordance with workplace procedures
	5.2	Fixed fire protection system plant is monitored and/or inspected, in accordance with workplace procedures, for normal operation or to detect deviations
	5.3	Corrective action is taken, in accordance with workplace procedures
	5.4	Appropriate personnel are notified when defects are detected, in accordance with workplace procedures
6 Complete documentation	**6.1**	Fixed fire protection system plant problems, movements, and status are reported, in accordance with workplace procedures
	6.2	Documentation is updated, in accordance with workplace procedures

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Foundation Skills

Foundation skills essential to performance are explicit in the performance criteria of this unit of competency.

Range of Conditions

Range is restricted to essential operating conditions and any other variables essential to the work environment.

Non-essential conditions may be found in the Companion Volume Implementation Guide.

Unit Mapping Information

This unit replaces and is equivalent to UEPOPS317B Operate and monitor fixed fire protection systems.

Links

Companion Volume implementation guides are found in VETNet - https://vetnet.gov.au/Pages/TrainingDocs.aspx?q=1715b9fa-e7bd-441c-bb8d-cf22c9c825a8

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Assessment Requirements for UEPOPS317 Operate and monitor fixed fire protection systems

Modification History

Release 1. This is the first release of this unit of competency in the UEP Generation Training Package.

Performance Evidence

Evidence required to demonstrate competence in this unit must be relevant to and satisfy all the requirements of the elements, performance criteria and range of conditions on at least two separate occasions and includes:

- analysing fixed fire protection system plant faults
- applying Work, Health and Safety (WHS)/Occupational Health and Safety (OHS) requirements including:
  - emergency procedures
  - risk control measures
  - safe work practices
- communicating with personnel
- completing documentation
- confirming operational status of firefighting and fire prevention equipment
- implementing legislation, industry standards, codes of practice and regulations
- interpreting manufacturers' specifications and manuals
- monitoring and inspecting fixed fire protection system plant operation
- operating fixed fire protection system plant
- preparing and planning work
- testing fixed fire protection system plant operationally

Knowledge Evidence

Evidence required to demonstrate competence in this unit must be relevant to and satisfy all the requirements of the elements, performance criteria and range of conditions and includes knowledge of:

- fire protection system testing
- fire suppression systems
- legislation, industry standards, codes of practice and regulations
- manufacturers' specifications and manuals
- operational status of firefighting and fire prevention equipment
- WHS/OHS legislated requirements including:

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  - emergency procedures
  - risk control measures
  - safe work practices
- workplace documentation including reports, records and logs
- workplace policies and procedures

Assessment Conditions

As a minimum, assessors must satisfy applicable regulatory requirements, which include requirements in the Standards for Registered Training Organisations current at the time of assessment.

As a minimum, assessment must satisfy applicable regulatory requirements, which include requirements in the Standards for Registered Training Organisations current at the time of assessment.

Assessment processes and techniques must be appropriate to the language, literacy and numeracy requirements of the work being performed and the needs of the candidate.

Assessment must occur in workplace operational situations. Where this is not appropriate, assessment must occur in simulated workplace operational situations that reflect workplace conditions.

Resources for assessment must include access to:

- a range of relevant exercises, case studies and/or other simulations
- relevant and appropriate materials, tools, equipment and personal protective equipment currently used in industry
- applicable documentation including workplace procedures, industry standards, equipment specifications, regulations, codes of practice and operation manuals.

Links

Companion Volume implementation guides are found in VETNet - https://vetnet.gov.au/Pages/TrainingDocs.aspx?q=1715b9fa-e7bd-441c-bb8d-cf22c9c825a8

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UEPOPS318 Operate and monitor compressed gas systems

Modification History

Release 1. This is the first release of this unit of competency in the UEP Generation Training Package.

Application

This unit involves the skills and knowledge required to operate compressed gas systems excluding air steam.

Compressed gas is gas contained under pressure, usually in a cylinder. Typically, a compressed gas system in a power generation facility will consist of a bulk compressed gas supply system rather than individual cylinders.

Competency in this unit requires the ability to plan work, operate compressed gas system plant, test compressed gas system plant, analyse compressed gas system plant faults, monitor and inspect compressed gas system plant and the completion all documentation. Individuals will, in general, work under supervision, in a power generation facility as a maintenance operator.

Power generation plant operators are typically trained and authorised to isolate, prepare plant and issue permits to work.

No licensing, legislative or certification requirements apply to this unit at the time of publication.

Note: Workplace practice

The application of the skills and knowledge described in this unit may require a licence or training permit to practice in the workplace where work is carried out on gas and electrical installations. Additional conditions may apply under state and territory legislative and regulatory licensing requirements.

Pre-requisite Unit

There are no prerequisite units.

Competency Field

Operations

Unit Sector

Electricity generation

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Elements and Performance Criteria

ELEMENTS	PERFORMANCE CRITERIA
Elements describe the essential outcomes.	Performance criteria describe the performance needed to demonstrate achievement of the element.
1 Plan and prepare work	**1.1** Safety issues related to operating and monitoring compressed gas system plant are identified, in accordance with workplace procedures and Work, Health and Safety (WHS)/Occupational Health and Safety (OHS) regulations and legislative requirements
	1.2 Work requirements are identified, in accordance with workplace procedures, from appropriate personnel and documentation
	1.3 Documentation to determine compressed gas system plant status is assessed and evaluated, in accordance with workplace procedures
	1.4 Inspection for compressed gas system plant service is carried out, in accordance with workplace procedures and manufacturers' operational requirements
	1.5 Compressed gas system plant operational prerequisites are established, in accordance with workplace procedures and manufacturers' recommendations
	1.6 Sequence for recommissioning of compressed gas system plant is determined, in accordance with workplace procedures and site requirements
2 Operate compressed gas system plant	**2.1** Compressed gas system plant is operated, in accordance with workplace procedures and manufacturers' operating recommendations
	2.2 Compressed gas system plant is monitored and observed, in accordance with workplace procedures, to detect deviations from normal operating conditions
	2.3 Corrective actions are taken to rectify compressed gas system plant abnormalities, in accordance with workplace procedures and site requirements
	2.4 Compressed gas system plant is identified and removed from service, in accordance with workplace procedures and site requirements

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	2.5	Corrective actions are taken, in accordance with workplace procedures when compressed gas system plant abnormalities are identified during removal from service
3 Test compressed gas system plant operation	**3.1**	Operational tests are performed, in accordance with workplace procedures
	3.2	Compressed gas system plant is observed for correct operational response, in accordance with workplace procedures
	3.3	Corrective action is taken, in accordance with workplace procedures, when response does not meet with documentation, plant integrity or personnel safety requirements
	3.4	Compressed gas system plant is returned to required operational status upon completion of test, in accordance with workplace procedures
4 Analyse compressed gas system plant faults	**4.1**	Causes of abnormal compressed gas system plant operating conditions are identified, in accordance with workplace procedures, and by analysing technical and operational information
	4.2	Corrective action is taken, in accordance with workplace procedures
	4.3	Compressed gas system plant integrity and personnel safety is maintained, in accordance with workplace procedures, and in consultation with appropriate personnel and technical and operational documentation
5 Monitor and inspect compressed gas system plant	**5.1**	Compressed gas system plant to be monitored and/or inspected is physically identified, in accordance with workplace procedures
	5.2	Compressed gas system plant is monitored and/or inspected, in accordance with workplace procedures, for normal operation or to detect deviations
	5.3	Corrective action is taken, in accordance with workplace procedures
	5.4	Appropriate personnel are notified, in accordance with workplace procedures, when defects are detected
6 Complete documentation	**6.1**	Compressed gas system plant problems, movements and

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status are reported, in accordance with workplace procedures

6.2 Documentation is updated, in accordance with workplace procedures

Foundation Skills

Foundation skills essential to performance are explicit in the performance criteria of this unit of competency.

Range of Conditions

Range is restricted to essential operating conditions and any other variables essential to the work environment.

Non-essential conditions may be found in the Companion Volume Implementation Guide.

Unit Mapping Information

This unit replaces and is equivalent to UEPOPS318B Operate and monitor compressed gas systems.

Links

Companion Volume implementation guides are found in VETNet - https://vetnet.gov.au/Pages/TrainingDocs.aspx?q=1715b9fa-e7bd-441c-bb8d-cf22c9c825a8

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Assessment Requirements for UEPOPS318 Operate and monitor compressed gas systems

Modification History

Release 1. This is the first release of this unit of competency in the UEP Generation Training Package.

Performance Evidence

Evidence required to demonstrate competence in this unit must be relevant to and satisfy all the requirements of the elements, performance criteria and range of conditions on at least two separate occasions and includes:

- analysing compressed gas systems plant faults using data analysis techniques and tools
- applying Work, Health and Safety (WHS)/Occupational Health and Safety (OHS) requirements including:
  - emergency procedures
  - risk control measures
  - safe work practices
- communicating with personnel
- completing documentation using recording procedures
- identifying compressed gas system plant status
- implementing legislation, industry standards, codes of practice and regulations
- interpreting manufacturers' specifications and manuals
- monitoring and inspecting compressed gas systems plant operation
- operating compressed gas system plant
- organising resources
- planning and preparing work
- preparing compressed gas system plant and/or equipment for operation
- recognising and responding to abnormal compressed gas system plant operating conditions
- testing compressed gas system plant operationally using diagnostic and testing techniques
- working with permit to work system

Knowledge Evidence

Evidence required to demonstrate competence in this unit must be relevant to and satisfy all the requirements of the elements, performance criteria and range of conditions and includes knowledge of:

- compressed gas system plant and equipment, its location and operating parameters
- compressed gas system plant status

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- legislation, industry standards, codes of practice and regulations
- manufacturers' specifications and manuals
- permit to work system
- typical arrangements of power production plant
- WHS/OHS legislated requirements including:
  - emergency procedures
  - risk control measures
  - safe work practices
- workplace documentation
- workplace policies and procedures

Assessment Conditions

As a minimum, assessors must satisfy applicable regulatory requirements, which include requirements in the Standards for Registered Training Organisations current at the time of assessment.

As a minimum, assessment must satisfy applicable regulatory requirements, which include requirements in the Standards for Registered Training Organisations current at the time of assessment.

Assessment processes and techniques must be appropriate to the language, literacy and numeracy requirements of the work being performed and the needs of the candidate.

Assessment must occur in workplace operational situations. Where this is not appropriate, assessment must occur in simulated workplace operational situations that reflect workplace conditions.

Resources for assessment must include access to:

- a range of relevant exercises, case studies and/or other simulations
- relevant and appropriate materials, tools, equipment and personal protective equipment currently used in industry
- applicable documentation including workplace procedures, industry standards, equipment specifications, regulations, codes of practice and operation manuals.

Links

Companion Volume implementation guides are found in VETNet - https://vetnet.gov.au/Pages/TrainingDocs.aspx?q=1715b9fa-e7bd-441c-bb8d-cf22c9c825a8

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UEPOPS319 Operate and monitor gas production plant

Modification History

Release 1. This is the first release of this unit of competency in the UEP Generation Training Package.

Application

This unit involves the skills and knowledge required to operate, inspect and monitor gas producing plant. Gas production plant is used for combustible gases which are fed into power turbines.

Competency in this unit requires the ability to plan work, operate compressed gas production plant, test compressed gas production plant, analyse compressed gas production plant faults, monitor and inspect compressed gas production plant and complete all documentation. Individuals will, in general, work under supervision, in a power generation facility as an operator.

Power generation plant operators are typically trained and authorised to isolate, prepare plant and issue permits to work.

No licensing, legislative or certification requirements apply to this unit at the time of publication.

Note: Workplace practice

The application of the skills and knowledge described in this unit may require a licence or training permit to practice in the workplace where work is carried out on gas and electrical installations. Additional conditions may apply under state and territory legislative and regulatory licensing requirements.

Pre-requisite Unit

There are no prerequisite units.

Competency Field

Operations

Unit Sector

Electricity generation

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Elements and Performance Criteria

ELEMENTS	PERFORMANCE CRITERIA
Elements describe the essential outcomes.	Performance criteria describe the performance needed to demonstrate achievement of the element.
1 Plan and prepare work	**1.1** Safety issues related to the operating and monitoring of gas production plant are identified, in accordance with workplace procedures and Work, Health and Safety (WHS)/Occupational Health and Safety (OHS) regulations and legislative requirements
	1.2 Work requirements are identified from appropriate personnel and documentation, in accordance with workplace procedures
	1.3 Documentation to determine gas production plant status is assessed and evaluated, in accordance with workplace procedures
	1.4 Inspection and field preparation for gas production service are carried out, in accordance with workplace procedures and manufacturers recommendations
	1.5 Gas production plant operational prerequisites are established, in accordance with workplace procedures and manufacturers' recommendations
	1.6 Sequence for recommissioning of gas production plant is determined, in accordance with workplace procedures and site requirements
2 Operate gas production plant	**2.1** Gas production plant is operated, in accordance with workplace procedures and manufacturers' operating recommendations
	2.2 Gas production plant is monitored and observed, in accordance with workplace procedures, to detect deviations from normal operating conditions
	2.3 Corrective actions are taken to rectify abnormalities, in accordance with workplace procedures and manufacturers' recommendations
3 Test gas production plant operation	**3.1** Operational tests are performed, in accordance with workplace procedures
	3.2 Gas production plant is observed for correct operational

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		response, in accordance with workplace procedures
	3.3	Corrective action is taken, in accordance with workplace procedures when response does not meet with documentation, gas production plant integrity or personnel safety requirements
	3.4	Gas production plant is returned to required operational status upon completion of test, in accordance with workplace procedures
4 Analyse gas production plant faults	**4.1**	Causes of abnormal gas production plant operating conditions are identified, in accordance with workplace procedures, and by analysing technical and operational information
	4.2	Corrective action is taken, in accordance with workplace procedures
	4.3	Gas production plant integrity and personnel safety is maintained, in accordance with workplace procedures, and in consultation with appropriate personnel and technical and operational documentation
5 Monitor and inspect gas production plant	**5.1**	Gas production plant to be monitored and/or inspected is physically identified, in accordance with workplace procedures
	5.2	Gas production plant is monitored and/or inspected, in accordance with workplace procedures, for normal operation or to detect deviations
	5.3	Corrective action is taken, in accordance with workplace procedures
	5.4	Appropriate personnel are notified, in accordance with workplace procedures, when defects are detected
6 Complete documentation	**6.1**	Gas production plant problems, movements, abnormalities and status are reported, in accordance with workplace procedures
	6.2	Documentation is updated, in accordance with workplace procedures

Foundation Skills

Foundation skills essential to performance are explicit in the performance criteria of this unit of

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competency.

Range of Conditions

Range is restricted to essential operating conditions and any other variables essential to the work environment.

Non-essential conditions may be found in the Companion Volume Implementation Guide.

Unit Mapping Information

This unit replaces and is equivalent to UEPOPS319B Operate and monitor gas production plant.

Links

Companion Volume implementation guides are found in VETNet - https://vetnet.gov.au/Pages/TrainingDocs.aspx?q=1715b9fa-e7bd-441c-bb8d-cf22c9c825a8

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Assessment Requirements for UEPOPS319 Operate and monitor gas production plant

Modification History

Release 1. This is the first release of this unit of competency in the UEP Generation Training Package.

Performance Evidence

Evidence required to demonstrate competence in this unit must be relevant to and satisfy all the requirements of the elements, performance criteria and range of conditions on at least two separate occasions and includes:

- analysing gas production plant faults using data analysis techniques and tools
- applying Work, Health and Safety (WHS)/Occupational Health and Safety (OHS) requirements including:
  - emergency procedures
  - risk control measures
  - safe working practices
- communicating with personnel
- completing documentation using recording procedures
- identifying gas production plant status
- implementing legislation, industry standards, codes of practice and regulations
- interpreting manufacturers' specifications and manuals
- monitoring and inspecting gas production plant operations
- operating gas production plant
- organising resources
- preparing and planning work
- preparing gas production plant and/or equipment for operation
- recognising and responding to abnormal gas production plant operating conditions
- testing gas production plant operations using diagnostic and test techniques
- working with permit to work system

Knowledge Evidence

Evidence required to demonstrate competence in this unit must be relevant to and satisfy all the requirements of the elements, performance criteria and range of conditions and includes knowledge of:

- gas production plant and equipment, its location and operating parameters
- gas production plant status

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- legislation, industry standards, codes of practice and regulations
- manufacturers' specifications and manuals
- permit to work system
- typical arrangements of power production plant
- WHS/OHS legislated requirements including:
  - emergency procedures
  - risk control measures
  - safe working practices
- workplace documentation
- workplace policies and procedures

Assessment Conditions

As a minimum, assessors must satisfy applicable regulatory requirements, which include requirements in the Standards for Registered Training Organisations current at the time of assessment.

As a minimum, assessment must satisfy applicable regulatory requirements, which include requirements in the Standards for Registered Training Organisations current at the time of assessment.

Assessment processes and techniques must be appropriate to the language, literacy and numeracy requirements of the work being performed and the needs of the candidate.

Assessment must occur in workplace operational situations. Where this is not appropriate, assessment must occur in simulated workplace operational situations that reflect workplace conditions.

Resources for assessment must include access to:

- a range of relevant exercises, case studies and/or other simulations
- relevant and appropriate materials, tools, equipment and personal protective equipment currently used in industry
- applicable documentation including workplace procedures, industry standards, equipment specifications, regulations, codes of practice and operation manuals.

Links

Companion Volume implementation guides are found in VETNet - https://vetnet.gov.au/Pages/TrainingDocs.aspx?q=1715b9fa-e7bd-441c-bb8d-cf22c9c825a8

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UEPOPS320 Operate and monitor compressed air systems

Modification History

Release 1. This is the first release of this unit of competency in the UEP Generation Training Package.

Application

This unit involves the skills and knowledge required to operate compressed air systems.

Compressed air is defined as air kept under a pressure that is greater than the atmospheric pressure. Compressed air is critical to the operation of plant in power generating facilities, such as air operated control valves and fabric filter cleaning systems.

Competency in this unit requires the ability to plan work, operate compressed air system plant, test compressed air system plant, analyse compressed air system plant faults, monitor and inspect compressed air system plant and the completion of all documentation. Individuals will, in general, work under supervision, in a power generating facility as an operator.

Power generation plant operators are typically trained and authorised to isolate, prepare plant and issue permits to work.

No licensing, legislative or certification requirements apply to this unit at the time of publication.

Note: Workplace practice

The application of the skills and knowledge described in this unit may require a licence or training permit to practice in the workplace where work is carried out on gas and electrical installations. Additional conditions may apply under state and territory legislative and regulatory licensing requirements.

Pre-requisite Unit

There are no prerequisites units.

Competency Field

Operations

Unit Sector

Electricity generation

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Elements and Performance Criteria

ELEMENTS	PERFORMANCE CRITERIA
Elements describe the essential outcomes.	Performance criteria describe the performance needed to demonstrate achievement of the element.
1 Plan and prepare work	**1.1** Safety issues related to operating and monitoring compressed air system plant are identified, in accordance with workplace procedures and Work, Health and Safety (WHS)/Occupational Health and Safety (OHS) regulations and legislative requirements
	1.2 Work requirements are identified, in accordance with workplace procedures, from relevant personnel and documentation
	1.3 Documentation to determine compressed air system plant status is assessed and evaluated, in accordance with workplace procedures
	1.4 Inspection and field preparation for compressed air system plant service are carried out, in accordance with workplace procedures and manufacturers' operational requirements
	1.5 Compressed air system plant operational prerequisites are established, in accordance with workplace procedures and manufacturers' requirements
	1.6 Sequence for recommissioning of compressed air system plant is determined, in accordance with workplace procedures and site requirements
2 Operate compressed air system plant	**2.1** Compressed air system plant is operated, in accordance with workplace procedures and manufacturers' operating recommendations
	2.2 Compressed air system plant is monitored and observed, in accordance with workplace procedures, to detect deviations from normal operating conditions
	2.3 Corrective actions are taken to rectify compressed air system plant abnormalities, in accordance with workplace procedures
	2.4 Compressed air system plant is identified and removed from service, in accordance with workplace procedures

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	2.5	Corrective actions are taken, in accordance with workplace procedures when compressed air system plant abnormalities are identified during removal from service
3 Test compressed air system plant operation	**3.1**	Operational tests are performed, in accordance with workplace procedures
	3.2	Compressed air system plant is observed for correct operational response, in accordance with workplace procedures
	3.3	Corrective action is taken, in accordance with workplace procedures, when response does not meet with documentation, compressed air system plant integrity or personnel safety requirements
	3.4	Compressed air system plant is returned to required operational status upon completion of testing, in accordance with workplace procedures
4 Analyse compressed air system plant faults	**4.1**	Causes of abnormal compressed air system plant operating conditions are identified, in accordance with workplace procedures, and by analysing technical and operational information
	4.2	Corrective action is taken, in accordance with workplace procedures
	4.3	Compressed air system plant integrity and personnel safety is maintained, in accordance with workplace procedures, and in consultation with appropriate personnel and technical and operational documentation
5 Monitor and inspect compressed air system plant	**5.1**	Compressed air system plant to be monitored and/or inspected is physically identified, in accordance with workplace procedures
	5.2	Compressed air system plant is monitored and/or inspected for normal operation or to detect deviations, in accordance with workplace procedures
	5.3	Corrective action is taken, in accordance with workplace procedures
	5.4	Appropriate personnel are notified when defects are detected, in accordance with workplace procedures
6 Complete documentation	**6.1**	Compressed air system plant problems, movements, abnormalities and status are reported, in accordance with

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workplace procedures

6.2 Documentation is updated, in accordance with workplace procedures

Foundation Skills

Foundation skills essential to performance are explicit in the performance criteria of this unit of competency.

Range of Conditions

Range is restricted to essential operating conditions and any other variables essential to the work environment.

Non-essential conditions may be found in the Companion Volume Implementation Guide.

Unit Mapping Information

This unit replaces and is equivalent to UEPOPS320B Operate and monitor compressed air systems.

Links

Companion Volume implementation guides are found in VETNet - https://vetnet.gov.au/Pages/TrainingDocs.aspx?q=1715b9fa-e7bd-441c-bb8d-cf22c9c825a8

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Assessment Requirements for UEPOPS320 Operate and monitor compressed air systems

Modification History

Release 1. This is the first release of this unit of competency in the UEP Generation Training Package.

Performance Evidence

Evidence required to demonstrate competence in this unit must be relevant to and satisfy all the requirements of the elements, performance criteria and range of conditions on at least two separate occasions and includes:

- analysing plant faults using data analysis techniques and tools
- applying Work, Health and Safety (WHS)/Occupational Health and Safety (OHS) requirements including:
  - emergency procedures
  - risk control measures
  - safe working practices
- assessing compressed air system plant operation using diagnostic and testing techniques
- communicating effectively with relevant personnel
- completing documentation
- identifying compressed air system plant status
- implementing legislation, industry standards, codes of practice and regulations
- interpreting manufacturers' specifications and manuals
- monitoring and inspecting compressed air system plant operation
- operating compressed air systems
- organising resources
- planning and preparing work
- preparing compressed air system plant or equipment for operation
- recognising and responding to abnormal compressed air system plant operating conditions
- working with permit to work system

Knowledge Evidence

Evidence required to demonstrate competence in this unit must be relevant to and satisfy all the requirements of the elements, performance criteria and range of conditions and includes knowledge of:

- compressed air system plant and equipment, its location and operating parameters
- compressed air system plant status

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- legislation, industry standards, codes of practice and regulations
- manufacturers' specifications and manuals
- permit to work system
- typical arrangements of power production plant
- WHS/OHS legislated requirements including:
  - emergency procedures
  - risk control measures
  - safe working practices
- workplace documentation
- workplace policies and procedures

Assessment Conditions

As a minimum, assessors must satisfy applicable regulatory requirements, which include requirements in the Standards for Registered Training Organisations current at the time of assessment.

As a minimum, assessment must satisfy applicable regulatory requirements, which include requirements in the Standards for Registered Training Organisations current at the time of assessment.

Assessment processes and techniques must be appropriate to the language, literacy and numeracy requirements of the work being performed and the needs of the candidate.

Assessment must occur in workplace operational situations. Where this is not appropriate, assessment must occur in simulated workplace operational situations that reflect workplace conditions.

Resources for assessment must include access to:

- a range of relevant exercises, case studies and/or other simulations
- relevant and appropriate materials, tools, equipment and personal protective equipment currently used in industry
- applicable documentation including workplace procedures, industry standards, equipment specifications, regulations, codes of practice and operation manuals.

Links

Companion Volume implementation guides are found in VETNet - https://vetnet.gov.au/Pages/TrainingDocs.aspx?q=1715b9fa-e7bd-441c-bb8d-cf22c9c825a8

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UEPOPS321 Operate and monitor water treatment plant

Modification History

Release 1. This is the first release of this unit of competency in the UEP Generation Training Package.

Application

This unit involves the skills and knowledge required to operate, inspect and monitor water treatment and purification plant.

Water treatment plants are typically used to clean waste water for reuse or discharge in power generation facilities. The water treatment process involves the purification of water through the removal of undesirable chemicals, contaminants, solids and gases.

Competency in this unit requires the ability to plan work, operate water treatment plant, test water treatment plant, analyse water treatment plant faults, monitor and inspect water treatment plant and the completion of all documentation. Individuals will, in general, work under supervision, in a power generation facility as an operator.

Power generation plant operators are typically trained and authorised to isolate, prepare plant and issue permits to work.

No licensing, legislative or certification requirements apply to this unit at the time of publication.

Note: Workplace practice

The application of the skills and knowledge described in this unit may require a licence or training permit to practice in the workplace where work is carried out on gas and electrical installations. Additional conditions may apply under state and territory legislative and regulatory licensing requirements.

Pre-requisite Unit

There are no prerequisite units.

Competency Field

Operations

Unit Sector

Electricity generation

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Elements and Performance Criteria

ELEMENTS	PERFORMANCE CRITERIA
Elements describe the essential outcomes.	Performance criteria describe the performance needed to demonstrate achievement of the element.
1 Plan and prepare work	**1.1** Safety issues related operating and monitoring water treatment plant are identified, in accordance with workplace procedures and Work, Health and Safety (WHS)/Occupational Health and Safety (OHS) regulations and legislative requirements
	1.2 Work requirements are identified, in accordance with workplace procedures, from relevant personnel and documentation
	1.3 Documentation to determine water treatment plant status is assessed and evaluated, in accordance with workplace procedures
	1.4 Inspection and field preparation for water treatment plant service are carried out, in accordance with workplace procedures and manufacturers' recommendations
	1.5 Water treatment plant operational prerequisites are established, in accordance with workplace procedures and manufacturers' recommendations
	1.6 Sequence for recommissioning of water treatment plant is determined, in accordance with workplace procedures and site requirements
2 Operate water treatment plant	**2.1** Water treatment plant is operated, in accordance with workplace procedures and manufacturers' operating recommendations
	2.2 Water treatment plant is monitored and observed, in accordance with workplace procedures, to detect deviations from normal operating conditions
	2.3 Corrective actions are taken to rectify abnormalities, in accordance with workplace procedures and manufacturers' recommendations
3 Test water treatment plant operation	**3.1** Operational tests are performed, in accordance with workplace procedures

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	3.2	Water treatment plant is observed for correct operational response, in accordance with workplace procedures
	3.3	Corrective action is taken, in accordance with workplace procedures, when response does not meet with documentation, water treatment plant integrity or personnel safety requirements
	3.4	Water treatment plant is returned to required operational status upon completion of testing, in accordance with workplace procedures
4 Analyse water treatment plant faults	**4.1**	Causes of abnormal water treatment plant operating conditions are identified, in accordance with workplace procedures, and by analysing technical and operational information
	4.2	Corrective action is taken, in accordance with workplace procedures
	4.3	Water treatment plant integrity and personnel safety is maintained, in accordance with workplace procedures, and in consultation with appropriate personnel and technical and operational documentation
5 Monitor and inspect water treatment plant	**5.1**	Water treatment plant to be monitored and inspected is physically identified, in accordance with workplace procedures
	5.2	Water treatment plant is monitored and inspected, in accordance with workplace procedures for normal operation or to detect deviations
	5.3	Corrective action is taken, in accordance with workplace procedures
	5.4	Appropriate personnel are notified, in accordance with workplace procedures, when defects are detected
6 Complete documentation	**6.1**	Water treatment plant problems, movements and status are reported, in accordance with workplace procedures
	6.2	Documentation is updated, in accordance with workplace procedures

Foundation Skills

Foundation skills essential to performance are explicit in the performance criteria of this unit of

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competency.

Range of Conditions

Range is restricted to essential operating conditions and any other variables essential to the work environment.

Non-essential conditions may be found in the Companion Volume Implementation Guide.

Unit Mapping Information

This unit replaces and is equivalent to UEPOPS321B Operate and monitor water treatment plant.

Links

Companion Volume implementation guides are found in VETNet - https://vetnet.gov.au/Pages/TrainingDocs.aspx?q=1715b9fa-e7bd-441c-bb8d-cf22c9c825a8

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Assessment Requirements for UEPOPS321 Operate and monitor water treatment plant

Modification History

Release 1. This is the first release of this unit of competency in the UEP Generation Training Package.

Performance Evidence

Evidence required to demonstrate competence in this unit must be relevant to and satisfy all the requirements of the elements, performance criteria and range of conditions on at least two separate occasions and includes:

- analysing water treatment plant faults using data analysis techniques and tools
- applying Work, Health and Safety (WHS)/Occupational Health and Safety (OHS) requirements including:
  - emergency procedures
  - risk control measures
  - safe working practices
- communicating with personnel
- completing documentation using recording procedures
- identifying water treatment plant status
- implementing legislation, industry standards, codes of practice and regulations
- interpreting manufacturers' specifications and manuals
- monitoring and inspecting water treatment plant operation
- operating water treatment plant
- organising resources
- planning and preparing work
- preparing water treatment plant or equipment for operation
- recognising and responding to abnormal water treatment plant operating conditions
- testing water treatment plant operationally using diagnostic and test techniques
- working with permit to work system

Knowledge Evidence

Evidence required to demonstrate competence in this unit must be relevant to and satisfy all the requirements of the elements, performance criteria and range of conditions and includes knowledge of:

- legislation, industry standards, codes of practice and regulations
- manufacturers' specifications and manuals

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- permit to work system
- typical arrangements of power production plant
- water treatment plant and equipment, its location and operating parameters
- water treatment plant status
- WHS/OHS legislated requirements including:
  - emergency procedures
  - risk control measures
  - safe working practices
- workplace documentation
- workplace policies and procedures

Assessment Conditions

As a minimum, assessors must satisfy applicable regulatory requirements, which include requirements in the Standards for Registered Training Organisations current at the time of assessment.

As a minimum, assessment must satisfy applicable regulatory requirements, which include requirements in the Standards for Registered Training Organisations current at the time of assessment.

Assessment processes and techniques must be appropriate to the language, literacy and numeracy requirements of the work being performed and the needs of the candidate.

Assessment must occur in workplace operational situations. Where this is not appropriate, assessment must occur in simulated workplace operational situations that reflect workplace conditions.

Resources for assessment must include access to:

- a range of relevant exercises, case studies and/or other simulations
- relevant and appropriate materials, tools, equipment and personal protective equipment currently used in industry
- applicable documentation including workplace procedures, industry standards, equipment specifications, regulations, codes of practice and operation manuals.

Links

Companion Volume implementation guides are found in VETNet - https://vetnet.gov.au/Pages/TrainingDocs.aspx?q=1715b9fa-e7bd-441c-bb8d-cf22c9c825a8

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UEPOPS322 Operate and monitor alkalinity reduction plant

Modification History

Release 1. This is the first release of this unit of competency in the UEP Generation Training Package.

Application

This unit involves the skills and knowledge required to operate, inspect and monitor alkalinity reduction plant which includes cooling tower water dosing equipment.

Alkalinity is a measure of the bicarbonates and carbonates in water i.e. a measure of limestone content in water. Alkalinity can affect the chlorine residual in power generation plant effluent.

Competency in this unit requires the ability to plan work, operate alkalinity reduction plant, test alkalinity reduction plant, analyse alkalinity reduction plant faults, monitor and inspect alkalinity reduction plant and complete all documentation. Individuals will, in general, work under supervision, in a power generation facility as an operator.

Power generation plant operators are typically trained and authorised to isolate, prepare plant and issue permits to work.

No licensing, legislative or certification requirements apply to this unit at the time of publication.

Note: Workplace practices

The application of the skills and knowledge described in this unit may require a licence or training permit to practice in the workplace where work is carried out on gas and electrical installations. Additional conditions may apply under state and territory legislative and regulatory licensing requirements.

Pre-requisite Unit

There are no prerequisite units.

Competency Field

Operations

Unit Sector

Electricity generation

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Elements and Performance Criteria

ELEMENTS	PERFORMANCE CRITERIA
Elements describe the essential outcomes.	Performance criteria describe the performance needed to demonstrate achievement of the element.
1 Plan and prepare work	**1.1** Safety issues related to the operating and monitoring of alkalinity reduction plant are identified, in accordance with workplace procedures and Work, Health and Safety (WHS)/Occupational Health and Safety (OHS) regulations and legislative requirements
	1.2 Work requirements are identified, in accordance with workplace procedures, from appropriate personnel and documentation
	1.3 Documentation to determine alkalinity reduction plant status is assessed and evaluated, in accordance with workplace procedures
	1.4 Inspection and field preparation for alkalinity reduction plant service is carried out, in accordance with workplace procedures and manufacturers' recommendations
	1.5 Alkalinity reduction plant operational prerequisites are established, in accordance with workplace procedures and manufacturers' recommendations
	1.6 Sequence for recommissioning of alkalinity reduction plant is determined, in accordance with workplace procedures and site requirements
2 Operate alkalinity reduction plant	**2.1** Alkalinity reduction plant is operated, in accordance with workplace procedures and manufacturers' operating recommendations
	2.2 Alkalinity reduction plant is monitored and observed, in accordance with workplace procedures, to detect deviations from normal operating conditions
	2.3 Corrective actions are taken to rectify abnormalities in alkalinity reduction plant, in accordance with workplace procedures and manufacturers' recommendations
	2.4 Alkalinity reduction plant is identified and removed from service, in accordance with workplace procedures and site requirements

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	2.5	Corrective actions are taken, in accordance with workplace procedures, when abnormalities are identified during the removal from service of alkalinity reduction plant
3 Test alkalinity reduction plant operation	**3.1**	Operational tests are performed, in accordance with workplace procedures
	3.2	Alkalinity reduction plant is observed for correct operational response, in accordance with workplace procedures
	3.3	Corrective action is taken, in accordance with workplace procedures, when response does not meet with documentation, alkalinity reduction plant integrity or personnel safety requirements
	3.4	Alkalinity reduction plant is returned to required operational status upon completion of testing, in accordance with workplace procedures
4 Analyse alkalinity reduction plant faults	**4.1**	Causes of abnormal alkalinity reduction plant operating conditions are identified, in accordance with workplace procedures, and by analysing technical and operational information
	4.2	Corrective action is taken, in accordance with workplace procedures
	4.3	Alkalinity reduction plant integrity, and personnel safety, is maintained, in accordance with workplace procedures, and in consultation with appropriate personnel and technical and operational documentation
5 Monitor and inspect alkalinity reduction plant	**5.1**	Alkalinity reduction plant to be monitored or inspected is physically identified, in accordance with workplace procedures
	5.2	Alkalinity reduction plant is monitored or inspected, in accordance with workplace procedures, for normal operation or to detect deviations
	5.3	Corrective action is taken, in accordance with workplace procedures
	5.4	Appropriate personnel are notified when defects are detected, in accordance with workplace procedures
6 Complete documentation	**6.1**	Alkalinity reduction plant problems, movements and

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status are reported, in accordance with workplace procedures

6.2 Documentation is updated, in accordance with workplace procedures

Foundation Skills

Foundation skills essential to performance are explicit in the performance criteria of this unit of competency.

Range of Conditions

Range is restricted to essential operating conditions and any other variables essential to the work environment.

Non-essential conditions may be found in the Companion Volume Implementation Guide.

Unit Mapping Information

This unit replaces and is equivalent to UEPOPS322B Operate and monitor alkalinity reduction plant.

Links

Companion Volume implementation guides are found in VETNet - https://vetnet.gov.au/Pages/TrainingDocs.aspx?q=1715b9fa-e7bd-441c-bb8d-cf22c9c825a8

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Assessment Requirements for UEPOPS322 Operate and monitor alkalinity reduction plant

Modification History

Release 1. This is the first release of this unit of competency in the UEP Generation Training Package.

Performance Evidence

Evidence required to demonstrate competence in this unit must be relevant to and satisfy all the requirements of the elements, performance criteria and range of conditions on at least two separate occasions and includes:

- analysing alkalinity reduction plant faults using data analysis techniques and tools
- applying Work, Health and Safety (WHS)/Occupational Health and Safety (OHS) requirements including:
  - chemical use and hazards
  - emergency procedures
  - risk control measures
  - safe work practices including use of Safety Data Sheets (SDS)/Material Safety Data Sheets (MSDS)
- communicating with personnel
- completing documentation
- identifying alkalinity reduction plant status
- implementing legislation, industry standards, codes of practice and regulations
- interpreting manufacturers specifications and manuals
- monitoring and inspecting alkalinity reduction plant operation
- operating alkalinity reduction plant
- organising resources
- planning and preparing work
- preparing alkalinity reduction plant and/or equipment for operation
- recognising and responding to abnormal alkalinity reduction plant operating conditions
- testing alkalinity reduction plant operations using diagnostic and test techniques
- working with permit to work system

Knowledge Evidence

Evidence required to demonstrate competence in this unit must be relevant to and satisfy all the requirements of the elements, performance criteria and range of conditions and includes knowledge of:

- alkalinity reduction plant and equipment, its location and operating parameters including

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supervisory, alarm, protection and control equipment
- alkalinity reduction plant status
- legislation, industry standards, codes of practice and regulations
- manufacturers' specifications and manuals
- permit to work system
- typical arrangements of power production plant
- WHS/OHS legislated requirements including:
  - chemical use and hazards
  - emergency procedures
  - risk control measures
  - safe work practices including use of Safety Data Sheets (SDS)/Material Safety Data Sheets (MSDS)
- workplace documentation
- workplace policies and procedures

Assessment Conditions

As a minimum, assessors must satisfy applicable regulatory requirements, which include requirements in the Standards for Registered Training Organisations current at the time of assessment.

As a minimum, assessment must satisfy applicable regulatory requirements, which include requirements in the Standards for Registered Training Organisations current at the time of assessment.

Assessment processes and techniques must be appropriate to the language, literacy and numeracy requirements of the work being performed and the needs of the candidate.

Assessment must occur in workplace operational situations. Where this is not appropriate, assessment must occur in simulated workplace operational situations that reflect workplace conditions.

Resources for assessment must include access to:

- a range of relevant exercises, case studies and/or other simulations
- relevant and appropriate materials, tools, equipment and personal protective equipment currently used in industry
- applicable documentation including workplace procedures, industry standards, equipment specifications, regulations, codes of practice and operation manuals.

Links

Companion Volume implementation guides are found in VETNet - https://vetnet.gov.au/Pages/TrainingDocs.aspx?q=1715b9fa-e7bd-441c-bb8d-cf22c9c825a8

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UEPOPS323 Operate and monitor reverse osmosis plant

Modification History

Release 1. This is the first release of this unit of competency in the UEP Generation Training Package.

Application

This unit involves the skills and knowledge required to operate, inspect and monitor reverse osmosis plant.

Reverse osmosis is a water purification technology that uses a semipermeable membrane to remove dissolved inorganic solids such as salts, ions, molecules and larger particles from water.

Competency in this unit requires the ability to plan work, operate reverse osmosis plant, test reverse osmosis plant, analyse reverse osmosis plant faults, monitor and inspect reverse osmosis plant and the completion of all documentation. Individuals will, in general, work under supervision, in a power generation facility as an operator.

Power generation plant operators are typically trained and authorised to isolate, prepare plant and issue permits to work.

No licensing, legislative or certification requirements apply to this unit at the time of publication.

Note: Workplace practice

The application of the skills and knowledge described in this unit may require a licence or training permit to practice in the workplace where work is carried out on gas and electrical installations. Additional conditions may apply under state and territory legislative and regulatory licensing requirements.

Pre-requisite Unit

There are no prerequisite units.

Competency Field

Operations

Unit Sector

Electricity generation

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Elements and Performance Criteria

ELEMENTS	PERFORMANCE CRITERIA
Elements describe the essential outcomes.	Performance criteria describe the performance needed to demonstrate achievement of the element.
1 Plan and prepare work	**1.1** Safety issues related to operating and monitoring reverse osmosis plant are identified, in accordance with workplace procedures and Work, Health and Safety (WHS)/Occupational Health and Safety (OHS) regulations and legislative requirements
	1.2 Work requirements are identified, in accordance with workplace procedures, from appropriate personnel and documentation
	1.3 Documentation to determine reverse osmosis plant status is assessed and evaluated, in accordance with workplace procedures
	1.4 Inspection and field preparations for reverse osmosis plant service are carried out, in accordance with workplace procedures and manufacturers' recommendations
	1.5 Reverse osmosis plant operational prerequisites are established, in accordance with workplace procedures and manufacturers' recommendations
	1.6 Sequence for recommissioning of reverse osmosis plant is determined to suit existing circumstances, in accordance with workplace procedures and site requirements
2 Operate reverse osmosis plant	**2.1** Reverse osmosis plant is operated in accordance with workplace procedures and manufacturers' operating recommendations
	2.2 Reverse osmosis plant is monitored and observed, in accordance with workplace procedures, to detect deviations from normal operating conditions
	2.3 Corrective actions are taken to rectify abnormalities in reverse osmosis plant, in accordance with workplace procedures and manufacturers' recommendations
	2.4 Reverse osmosis plant is identified and removed from service, in accordance with workplace procedures and

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		site requirements
	2.5	Corrective actions are taken, in accordance with workplace procedures, when abnormalities are identified during the removal of reverse osmosis plant from service
3 Test reverse osmosis plant operation	**3.1**	Operational tests are performed, in accordance with workplace procedures
	3.2	Reverse osmosis plant is observed for correct operational response, in accordance with workplace procedures
	3.3	Corrective action is taken, in accordance with workplace procedures, when response does not meet with documentation, reverse osmosis plant integrity or personnel safety requirements
	3.4	Reverse osmosis plant is returned to required operational status upon completion of testing, in accordance with workplace procedures
4 Analyse reverse osmosis plant faults	**4.1**	Causes of abnormal reverse osmosis plant operating conditions are identified, in accordance with workplace procedures, by analysing technical and operational information
	4.2	Corrective action is taken, in accordance with workplace procedures
	4.3	Reverse osmosis plant integrity and personnel safety is maintained, in accordance with workplace procedures, and in consultation with appropriate personnel and technical and operational documentation
5 Monitor and inspect reverse osmosis plant	**5.1**	Reverse osmosis plant to be monitored and/or inspected is physically identified, in accordance with workplace procedures
	5.2	Reverse osmosis plant is monitored and/or inspected, in accordance with workplace procedures, for normal operation or to detect deviations
	5.3	Corrective action is taken, in accordance with workplace procedures
	5.4	Appropriate personnel are notified when defects are detected, in accordance with workplace procedures

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6 Complete documentation	**6.1**	Reverse osmosis plant problems, movements, abnormalities and status are reported, in accordance with workplace procedures
	6.2	Documentation is updated, in accordance with workplace procedures

Foundation Skills

Foundation skills essential to performance are explicit in the performance criteria of this unit of competency.

Range of Conditions

Range is restricted to essential operating conditions and any other variables essential to the work environment.

Non-essential conditions may be found in the Companion Volume Implementation Guide.

Unit Mapping Information

This unit replaces and is equivalent to UEPOPS323B Operate and monitor reverse osmosis plant.

Links

Companion Volume implementation guides are found in VETNet - https://vetnet.gov.au/Pages/TrainingDocs.aspx?q=1715b9fa-e7bd-441c-bb8d-cf22c9c825a8

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Assessment Requirements for UEPOPS323 Operate and monitor reverse osmosis plant

Modification History

Release 1. This is the first release of this unit of competency in the UEP Generation Training Package.

Performance Evidence

Evidence required to demonstrate competence in this unit must be relevant to and satisfy all the requirements of the elements, performance criteria and range of conditions on at least two separate occasions and includes:

- analysing reverse osmosis plant faults using data analysis techniques and tools
- applying Work, Health and Safety (WHS)/Occupational Health and Safety (OHS) requirements including:
  - chemical use and hazards
  - emergency procedures
  - risk control measures
  - safe working practices
- communicating with personnel
- completing documentation using recording procedures
- determining permit to work
- identifying and responding to abnormal reverse osmosis plant operating conditions
- identifying reverse osmosis plant status
- implementing legislation, industry standards, codes of practice and regulations
- interpreting manufacturers' specifications and manuals
- monitoring and inspecting reverse osmosis plant operation
- operating reverse osmosis plant
- organising resources
- preparing and planning work
- testing reverse osmosis plant operationally using diagnostic and test techniques
- working with reverse osmosis plant and/or equipment

Knowledge Evidence

Evidence required to demonstrate competence in this unit must be relevant to and satisfy all the requirements of the elements, performance criteria and range of conditions and includes knowledge of:

- legislation, industry standards, codes of practice and regulations

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- manufacturers' specifications and manuals
- permit to work system
- reverse osmosis plant and equipment, its location and operating parameters
- reverse osmosis plant status
- typical arrangements of power production plant
- WHS/OHS legislated requirements including:
  - emergency procedures
  - risk control measures
  - safe working practices
  - chemical use and hazards
- workplace documentation
- workplace policies and procedures

Assessment Conditions

As a minimum, assessors must satisfy applicable regulatory requirements, which include requirements in the Standards for Registered Training Organisations current at the time of assessment.

As a minimum, assessment must satisfy applicable regulatory requirements, which include requirements in the Standards for Registered Training Organisations current at the time of assessment.

Assessment processes and techniques must be appropriate to the language, literacy and numeracy requirements of the work being performed and the needs of the candidate.

Assessment must occur in workplace operational situations. Where this is not appropriate, assessment must occur in simulated workplace operational situations that reflect workplace conditions.

Resources for assessment must include access to:

- a range of relevant exercises, case studies and/or other simulations
- relevant and appropriate materials, tools, equipment and personal protective equipment currently used in industry
- applicable documentation including workplace procedures, industry standards, equipment specifications, regulations, codes of practice and operation manuals.

Links

Companion Volume implementation guides are found in VETNet - https://vetnet.gov.au/Pages/TrainingDocs.aspx?q=1715b9fa-e7bd-441c-bb8d-cf22c9c825a8

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UEPOPS324 Operate and monitor brine concentrator plant

Modification History

Release 1. This is the first release of this unit of competency in the UEP Generation Training Package.

Application

This unit involves the skills and knowledge required to operate, inspect and monitor brine concentrator plant.

Power generation facilities typically produce waste water that contains minerals and solids. Brine concentrators are used to remove these impurities as part of the waste water management and treatment process.

Competency in this unit requires the ability to plan work, operate brine concentrator plant, test brine concentrator plant, analyse brine concentrator plant faults, monitor and inspect brine concentrator plant and the completion of all documentation. Individuals will, in general, work under supervision, in a power generation facility as an operator.

Power generation plant operators are typically trained and authorised to isolate, prepare plant and issue permits to work.

No licensing, legislative or certification requirements apply to this unit at the time of publication.

Note: Workplace practice

The application of the skills and knowledge described in this unit may require a licence or training permit to practice in the workplace where work is carried out on gas and electrical installations. Additional conditions may apply under state and territory legislative and regulatory licensing requirements.

Pre-requisite Unit

There are no prerequisite units.

Competency Field

Operations

Unit Sector

Electricity generation

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Elements and Performance Criteria

ELEMENTS	PERFORMANCE CRITERIA
Elements describe the essential outcomes.	Performance criteria describe the performance needed to demonstrate achievement of the element.
1 Plan and prepare work	**1.1** Safety issues related to operating and monitoring brine concentrator plant are identified, in accordance with workplace procedures and Work, Health and Safety (WHS)/Occupational Health and Safety (OHS) regulations and legislative requirements
	1.2 Work requirements are identified, in accordance with workplace procedures from appropriate personnel and documentation
	1.3 Documentation to determine brine concentrator plant status is assessed and evaluated, in accordance with workplace procedures
	1.4 Inspection and field preparations for brine concentrator service are carried out, in accordance with workplace and manufacturers' procedures
	1.5 Brine concentrator plant operational prerequisites are established, in accordance with workplace procedures and manufacturers' recommendations
	1.6 Sequence for recommissioning of brine concentrator plant is determined, in accordance with workplace procedures and site requirements
2 Operate brine concentrator plant	**2.1** Brine concentrator plant is operated, in accordance with workplace procedures and manufacturers' operating recommendations
	2.2 Brine concentrator plant is monitored and observed, in accordance with workplace procedures, to detect deviations from normal operating conditions
	2.3 Corrective actions are taken to rectify brine concentrator abnormalities, in accordance with workplace procedures and manufacturers' recommendations
	2.4 Brine concentrator plant is identified and removed from service, in accordance with workplace procedures and site requirements

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	2.5	Corrective actions are taken, in accordance with workplace procedures when brine concentrator abnormalities are identified during removal from service
3 Test brine concentrator plant operation	**3.1**	Operational tests are performed, in accordance with workplace procedures
	3.2	Brine concentrator plant is observed for correct operational response, in accordance with workplace procedures
	3.3	Corrective action is taken, in accordance with workplace procedures, when response does not meet with documentation, brine concentrator plant integrity or personnel safety requirements
	3.4	Brine concentrator plant is returned to required operational status upon completion of testing, in accordance with workplace procedures
4 Analyse brine concentrator plant faults	**4.1**	Cause of abnormal brine concentrator plant operating conditions are identified, in accordance with workplace procedures, by analysing technical and operational information
	4.2	Corrective action is taken, in accordance with workplace procedures
	4.3	Brine concentrator plant integrity and personnel safety is maintained, in accordance with workplace procedures, and in consultation with appropriate personnel and technical and operational documentation
5 Monitor and inspect brine concentrator plant	**5.1**	Brine concentrator plant to be monitored or inspected is physically identified, in accordance with workplace procedures
	5.2	Brine concentrator plant is monitored or inspected, in accordance with workplace procedures for normal operation or to detect deviations
	5.3	Corrective action is taken, in accordance with workplace procedures
6 Complete documentation	**6.1**	Brine concentrator plant problems, movements, abnormalities and status are reported, in accordance with workplace procedures
	6.2	Documentation is updated, in accordance with

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workplace procedures

Foundation Skills

Foundation skills essential to performance are explicit in the performance criteria of this unit of competency.

Range of Conditions

Range is restricted to essential operating conditions and any other variables essential to the work environment.

Non-essential conditions may be found in the Companion Volume Implementation Guide.

Unit Mapping Information

This unit replaces and is equivalent to UEPOPS324B Operate and monitor brine concentrator plant.

Links

Companion Volume implementation guides are found in VETNet - https://vetnet.gov.au/Pages/TrainingDocs.aspx?q=1715b9fa-e7bd-441c-bb8d-cf22c9c825a8

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Assessment Requirements for UEPOPS324 Operate and monitor brine concentrator plant

Modification History

Release 1. This is the first release of this unit of competency in the UEP Generation Training Package.

Performance Evidence

Evidence required to demonstrate competence in this unit must be relevant to and satisfy all the requirements of the elements, performance criteria and range of conditions on at least two separate occasions and includes:

- analysing brine concentrator plant faults using data analysis techniques and tools
- applying Work, Health and Safety (WHS)/Occupational Health and Safety (OHS) requirements including:
  - chemical uses and hazards
  - emergency procedures
  - risk control measures
  - safe working practices
- communicating with personnel
- completing documentation using recording procedures
- identifying brine concentrator plant status
- implementing legislation, industry standards, codes of practice and regulations
- interpreting manufacturers' specifications and manuals
- monitoring and inspecting brine concentrator plant operation
- operating brine concentrator plant
- organising resources
- preparing and planning work
- recognising and responding to abnormal brine concentrator plant operating conditions
- testing brine concentrator plant operationally using diagnostic and test techniques
- working with brine concentrator plant and/or equipment
- working with permit to work system

Knowledge Evidence

Evidence required to demonstrate competence in this unit must be relevant to and satisfy all the requirements of the elements, performance criteria and range of conditions and includes knowledge of:

- brine concentrator plant and equipment, its location and operating parameters

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- brine concentrator plant status
- legislation, industry standards, codes of practice and regulations
- manufacturers' specifications and manuals
- permit to work system
- recording procedures
- safe operating principles
- typical arrangements of power production plant
- WHS/OHS legislated requirements including:
  - chemical uses and hazards
  - emergency procedures
  - risk control measures
  - safe working practices
- workplace documentation
- workplace policies and procedures

Assessment Conditions

As a minimum, assessors must satisfy applicable regulatory requirements, which include requirements in the Standards for Registered Training Organisations current at the time of assessment.

As a minimum, assessment must satisfy applicable regulatory requirements, which include requirements in the Standards for Registered Training Organisations current at the time of assessment.

Assessment processes and techniques must be appropriate to the language, literacy and numeracy requirements of the work being performed and the needs of the candidate.

Assessment must occur in workplace operational situations. Where this is not appropriate, assessment must occur in simulated workplace operational situations that reflect workplace conditions.

Resources for assessment must include access to:

- a range of relevant exercises, case studies and/or other simulations
- relevant and appropriate materials, tools, equipment and personal protective equipment currently used in industry
- applicable documentation including workplace procedures, industry standards, equipment specifications, regulations, codes of practice and operation manuals.

Links

Companion Volume implementation guides are found in VETNet - https://vetnet.gov.au/Pages/TrainingDocs.aspx?q=1715b9fa-e7bd-441c-bb8d-cf22c9c825a8

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UEPOPS325 Operate and monitor water quality monitoring systems

Modification History

Release 1. This is the first release of this unit of competency in the UEP Generation Training Package.

Application

This unit involves the skills and knowledge required to operate and monitor water quality monitoring systems in a power generation facility. These systems include all analytical devices used to monitor process chemical conditions.

Water quality refers to the chemical, physical, biological and or radiological characteristics of water. Water quality is a crucial factor for avoiding corrosion and scaling of turbines, boilers and pipes in power generating plant.

Competency in this unit requires the ability to plan work, operate water quality monitoring systems plant, test water quality monitoring systems plant, analyse water quality monitoring systems plant faults, monitor and inspect water quality monitoring systems plant and complete all documentation. Individuals will, in general, work under supervision, in a power generation facility as an operator.

Power generation plant operators are typically trained and authorised to isolate, prepare plant and issue permits to work.

No licensing, legislative or certification requirements apply to this unit at the time of publication.

Note: Workplace practice

The application of the skills and knowledge described in this unit may require a licence or training permit to practice in the workplace where work is carried out on gas and electrical installations. Additional conditions may apply under state and territory legislative and regulatory licensing requirements.

Pre-requisite Unit

There are no prerequisite units.

Competency Field

Operations

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Unit Sector

Electricity generation

Elements and Performance Criteria

ELEMENTS	PERFORMANCE CRITERIA
Elements describe the essential outcomes.	Performance criteria describe the performance needed to demonstrate achievement of the element.
1 Plan and prepare work	**1.1** Safety issues related to operating and monitoring water quality monitoring system plant are identified, in accordance with workplace procedures and Work, Health and Safety (WHS)/Occupational Health and Safety (OHS) regulations and legislative requirements
	1.2 Work requirements are identified, in accordance with workplace procedures, from appropriate personnel and documentation
	1.3 Documentation to determine water quality monitoring system plant status is assessed and evaluated, in accordance with workplace procedures
	1.4 Water quality monitoring system plant inspection is carried out, in accordance with workplace procedures and manufacturers' recommendations
	1.5 Water quality monitoring system plant operational prerequisites are established, in accordance with workplace procedures and manufacturers' recommendations
	1.6 Sequence for recommissioning of water quality monitoring system plant is determined, in accordance with workplace procedures and site requirements
2 Operate water quality monitoring system plant	**2.1** Water quality monitoring system plant is operated, in accordance with workplace procedures and manufacturers' operating recommendations
	2.2 Water quality monitoring system plant is monitored and observed, in accordance with workplace procedures, to detect deviations from normal operating conditions
	2.3 Corrective actions are taken to rectify abnormalities in water quality monitoring system plant, in accordance with workplace procedures and manufacturers'

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		recommendations
3	**Test water quality monitoring system plant operation**	**3.1** Operational tests are performed, in accordance with workplace procedures
		3.2 Water quality monitoring system plant is observed for correct operational response, in accordance with workplace procedures
		3.3 Water quality monitoring system plant is returned to required operational status upon completion of testing, in accordance with workplace procedures
4	**Analyse water quality monitoring system plant conditions**	**4.1** Cause of abnormal water quality monitoring system plant conditions are identified, in accordance with workplace procedures, and by analysing technical and operational information
		4.2 Corrective action is taken, in accordance with workplace procedures, when response does not meet with documentation, water quality monitoring system plant integrity or personnel safety requirements
		4.3 Water quality monitoring system plant integrity and personnel safety is maintained, in accordance with workplace procedures, and in consultation with appropriate personnel and technical and operational documentation
5	**Monitor and inspect water quality monitoring system plant**	**5.1** Water quality monitoring system plant to be monitored and inspected is physically identified, in accordance with workplace procedures
		5.2 Water quality monitoring system plant is monitored and inspected, in accordance with workplace procedures, for normal operation or to detect deviations
		5.3 Corrective action is taken, in accordance with workplace procedures
		5.4 Appropriate personnel are notified when defects are detected, in accordance with workplace procedures
6	**Complete documentation**	**6.1** Water quality monitoring systems plant problems, movements, abnormalities and status are reported, in accordance with workplace procedures
		6.2 Documentation is updated, in accordance with

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workplace procedures

Foundation Skills

Foundation skills essential to performance are explicit in the performance criteria of this unit of competency.

Range of Conditions

Range is restricted to essential operating conditions and any other variables essential to the work environment.

Non-essential conditions may be found in the Companion Volume Implementation Guide.

Unit Mapping Information

This unit replaces and is equivalent to UEPOPS325B Operate and monitor water quality monitoring systems.

Links

Companion Volume implementation guides are found in VETNet - https://vetnet.gov.au/Pages/TrainingDocs.aspx?q=1715b9fa-e7bd-441c-bb8d-cf22c9c825a8

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Assessment Requirements for UEPOPS325 Operate and monitor water quality monitoring systems

Modification History

Release 1. This is the first release of this unit of competency in the UEP Generation Training Package.

Performance Evidence

Evidence required to demonstrate competence in this unit must be relevant to and satisfy all the requirements of the elements, performance criteria and range of conditions on at least two separate occasions and includes:

- analysing water quality monitoring system plant faults using data analysis techniques and tools
- applying Work, Health and Safety (WHS)/Occupational Health and Safety (OHS) requirements including:
  - emergency procedures
  - risk control measures
  - safe working practices including use of Safety Data Sheets (SDS)/Material Safe Handling Data Sheets (MSDS)
- communicating with personnel
- completing documentation using recording procedures
- identifying water quality monitoring system plant status
- interpreting manufacturers' specifications and manuals
- legislation, industry standards, codes of practice and regulations
- monitoring and inspecting water quality monitoring system plant operation
- operating water quality monitoring system plant
- organising resources
- preparing and planning work
- recognising and responding to abnormal water quality monitoring system plant operating conditions
- testing water quality monitoring system plant operationally using diagnostic and test techniques
- using permit to work system
- working with water quality monitoring system plant and/or equipment

Knowledge Evidence

Evidence required to demonstrate competence in this unit must be relevant to and satisfy all the requirements of the elements, performance criteria and range of conditions and includes

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knowledge of:

- legislation, industry standards, codes of practice and regulations
- manufacturers' specifications and manuals
- permit to work system
- typical arrangements of power production plant including general responsibilities for power production plant operations
- water quality monitoring system plant and equipment, its location and operating parameters
- water quality monitoring system plant status
- WHS/OHS legislated requirements including:
  - emergency procedures
  - risk control measures
  - safe working practices including use of Safety Data Sheets (SDS)/Material Safe Handling Data Sheets (MSDS)
- workplace documentation
- workplace policies and procedures

Assessment Conditions

As a minimum, assessors must satisfy applicable regulatory requirements, which include requirements in the Standards for Registered Training Organisations current at the time of assessment.

As a minimum, assessment must satisfy applicable regulatory requirements, which include requirements in the Standards for Registered Training Organisations current at the time of assessment.

Assessment processes and techniques must be appropriate to the language, literacy and numeracy requirements of the work being performed and the needs of the candidate.

Assessment must occur in workplace operational situations. Where this is not appropriate, assessment must occur in simulated workplace operational situations that reflect workplace conditions.

Resources for assessment must include access to:

- a range of relevant exercises, case studies and/or other simulations
- relevant and appropriate materials, tools, equipment and personal protective equipment currently used in industry
- applicable documentation including workplace procedures, industry standards, equipment specifications, regulations, codes of practice and operation manuals.

Links

Companion Volume implementation guides are found in VETNet - https://vetnet.gov.au/Pages/TrainingDocs.aspx?q=1715b9fa-e7bd-441c-bb8d-cf22c9c825a8

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UEPOPS326 Operate and monitor oil systems

Modification History

Release 1. This is the first release of this unit of competency in the UEP Generation Training Package.

Application

This unit involves the skills and knowledge required to operate, monitor and inspect oil systems.

Power generation facilities rely on oil systems to run power generation applications. Maintaining clean oil systems is essential to equipment and plant reliability.

Competency in this unit requires the ability to plan work, operate oil systems plant, test oil systems plant, analyse oil systems plant faults, monitor and inspect oil systems plant and the completion of all documentation. Individuals will, in general, work under supervision, in a power generation facility as an operator.

Power generation plant operators are typically trained and authorised to isolate, prepare plant and issue permits to work.

No licensing, legislative or certification requirements apply to this unit at the time of publication.

Note: Workplace practice

The application of the skills and knowledge described in this unit may require a licence or training permit to practice in the workplace where work is carried out on gas and electrical installations. Additional conditions may apply under state and territory legislative and regulatory licensing requirements.

Pre-requisite Unit

There are no prerequisite units.

Competency Field

Operations

Unit Sector

Electricity generation

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Elements and Performance Criteria

ELEMENTS	PERFORMANCE CRITERIA
Elements describe the essential outcomes.	Performance criteria describe the performance needed to demonstrate achievement of the element.
1 Plan and prepare work	**1.1** Safety issues related to operating and monitoring oil system plant are identified, in accordance with workplace procedures and Work, Health and Safety (WHS)/Occupational Health and Safety (OHS) regulations and legislative requirements
	1.2 Work requirements are identified, in accordance with workplace procedures from appropriate personnel and documentation
	1.3 Documentation to determine oil system plant status is assessed and evaluated, in accordance with workplace procedures
	1.4 Inspection, preoperational checks and field preparations for oil system service are carried out, in accordance with workplace procedures and manufacturers' recommendations
	1.5 Oil system plant operational prerequisites are established, in accordance with workplace procedures and manufacturers' recommendations
	1.6 Sequence for recommissioning of oil system plant is determined, in accordance with workplace procedures and site requirements
2 Operate oil system plant	**2.1** Oil system plant is operated, in accordance with workplace procedures and manufacturers' operating recommendations
	2.2 Oil system plant is monitored and observed, in accordance with workplace procedures, to detect deviations from normal operating conditions
	2.3 Corrective actions are taken, to rectify oil system plant abnormalities, in accordance with workplace procedures, industry standards and site requirements
	2.4 Oil system plant is removed from service, in accordance with workplace procedures and site requirements

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3	**Test oil system plant operation**	**3.1** Operational tests are performed, in accordance with workplace procedures
		3.2 Oil systems plant is observed for correct operational response, in accordance with workplace procedures
		3.3 Corrective action is taken when response does not meet with documentation, oil system plant integrity or personnel safety requirements
		3.4 Oil system plant is returned to required operational status upon completion of testing, in accordance with workplace procedures
4	**Analyse oil system plant faults**	**4.1** Causes of abnormal oil system plant operating conditions are identified, in accordance with workplace procedures, and by analysing technical and operational information
		4.2 Corrective action is taken, in accordance with workplace procedures
		4.3 Oil system plant integrity and personnel safety is maintained, in accordance with workplace procedures, and by consultation with appropriate personnel and technical and operational documentation
5	**Monitor and inspect oil system plant**	**5.1** Oil system plant to be monitored and/or inspected is physically identified, in accordance with workplace procedures
		5.2 Oil system plant is monitored and/or inspected, in accordance with workplace procedures, to detect deviations from normal operating conditions
		5.3 Corrective action is taken, in accordance with workplace procedures
		5.4 Appropriate personnel are notified when defects are detected, in accordance with workplace procedures
6	**Complete documentation**	**6.1** Oil system plant problems, movements, abnormalities and status are reported, in accordance with workplace procedures
		6.2 Documentation is updated, in accordance with workplace procedures

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Foundation Skills

Foundation skills essential to performance are explicit in the performance criteria of this unit of competency.

Range of Conditions

Range is restricted to essential operating conditions and any other variables essential to the work environment.

Non-essential conditions may be found in the Companion Volume Implementation Guide.

Unit Mapping Information

This unit replaces and is equivalent to UEPOPS326B Operate and monitor oil systems.

Links

Companion Volume implementation guides are found in VETNet - https://vetnet.gov.au/Pages/TrainingDocs.aspx?q=1715b9fa-e7bd-441c-bb8d-cf22c9c825a8

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Assessment Requirements for UEPOPS326 Operate and monitor oil systems

Modification History

Release 1. This is the first release of this unit of competency in the UEP Generation Training Package.

Performance Evidence

Evidence required to demonstrate competence in this unit must be relevant to and satisfy all the requirements of the elements, performance criteria and range of conditions on at least two separate occasions and includes:

- analysing oil system plant faults data analysis techniques and tools
- applying Work, Health and Safety (WHS)/Occupational Health and Safety (OHS) requirements including:
  - emergency procedures
  - risk control measures
  - safe working practices
- communicating with personnel
- completing documentation
- identifying oil system plant status
- implementing legislation, industry standards, codes of practice and regulations
- interpreting manufacturers' specifications and manuals
- monitoring and inspecting oil system plant operation
- operating oil system plant
- organising resources
- preparing and planning work
- recognising and responding to abnormal oil system plant operating conditions
- testing oil system plant operationally diagnostic and testing techniques
- utilising permit to work system
- working with oil system plant and/or equipment

Knowledge Evidence

Evidence required to demonstrate competence in this unit must be relevant to and satisfy all the requirements of the elements, performance criteria and range of conditions and includes knowledge of:

- legislation, industry standards, codes of practice and regulations
- manufacturers' specifications and manuals
- oil system plant and equipment, its location and operating parameters including supervisory,

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alarm, protection and control equipment
- oil system plant status
- permit to work system
- typical arrangements of power production plant
- WHS/OHS legislated requirements including:
  - emergency procedures
  - risk control measures
  - safe working practices
- workplace documentation
- workplace policies and procedures

Assessment Conditions

As a minimum, assessors must satisfy applicable regulatory requirements, which include requirements in the Standards for Registered Training Organisations current at the time of assessment.

As a minimum, assessment must satisfy applicable regulatory requirements, which include requirements in the Standards for Registered Training Organisations current at the time of assessment.

Assessment processes and techniques must be appropriate to the language, literacy and numeracy requirements of the work being performed and the needs of the candidate.

Assessment must occur in workplace operational situations. Where this is not appropriate, assessment must occur in simulated workplace operational situations that reflect workplace conditions.

Resources for assessment must include access to:

- a range of relevant exercises, case studies and/or other simulations
- relevant and appropriate materials, tools, equipment and personal protective equipment currently used in industry
- applicable documentation including workplace procedures, industry standards, equipment specifications, regulations, codes of practice and operation manuals.

Links

Companion Volume implementation guides are found in VETNet - https://vetnet.gov.au/Pages/TrainingDocs.aspx?q=1715b9fa-e7bd-441c-bb8d-cf22c9c825a8

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UEPOPS327 Monitor and maintain civil assets

Modification History

Release 1. This is the first release of this unit of competency in the UEP Generation Training Package.

Application

This unit involves the skills and knowledge required to monitor and conduct maintenance to ensure the integrity of power generation civil assets.

Civil asset maintenance strategies are used to preserve and extend the service life of infrastructure. Civil assets may include infrastructure such as water treatment facilities, sewer pipelines, roads, utility grids, bridges, tunnels and railways.

Competency in this unit requires the ability to plan work, monitor civil assets, maintain civil assets and the completion of all work. Individuals will, in general, work as an operator, in a power generation facility.

No licensing, legislative or certification requirements apply to this unit at the time of publication.

Note: Workplace practice

The application of the skills and knowledge described in this unit may require a licence or training permit to practice in the workplace where work is carried out on gas and electrical installations. Additional conditions may apply under state and territory legislative and regulatory licensing requirements.

Pre-requisite Unit

There are no prerequisite units.

Competency Field

Operations

Unit Sector

Electricity generation

Elements and Performance Criteria

ELEMENTS **PERFORMANCE CRITERIA**

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Elements describe the essential outcomes.	Performance criteria describe the performance needed to demonstrate achievement of the element.
1 Plan and prepare for work	**1.1** Work, Health and Safety (WHS)/Occupational Health and Safety(OHS) regulations, legislative requirements, industry standards, codes of practice, manufacturers' specifications, environmental obligations and workplace procedures are identified, applied and monitored
	1.2 Work requirements are identified from work orders and are confirmed with appropriate parties or by site inspection, in accordance with workplace procedures
	1.3 Resources to satisfy work requirements are obtained and inspected for compliance, in accordance with workplace procedures
	1.4 Potential hazards are identified and risk control measures are selected and implemented, in accordance with workplace procedures
	1.5 Work is sequenced and prioritised, in accordance with workplace procedures and site requirements
2 Monitor civil assets	**2.1** Monitoring frequency of civil assets is determined, in accordance with workplace procedures and site requirements
	2.2 Check list for civil asset monitoring is maintained, in accordance with workplace procedures and site requirements
	2.3 Abnormal events or conditions are reported to appropriate personnel, in accordance with workplace procedures and site requirements
3 Maintain civil assets	**3.1** Maintenance of civil assets is undertaken, in accordance with workplace procedures and site requirements
	3.2 Appropriate tools, equipment and/or plant required to maintain civil assets is utilised, in accordance with workplace procedures and manufacturers' specifications
4 Complete work	**4.1** Maintenance work is completed and appropriate personnel are notified, in accordance with workplace procedures and site requirements
	4.2 Work area is cleared of waste, cleaned, restored and secured, in accordance with workplace procedures and

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site requirements

4.3 Civil asset maintenance tools and equipment are maintained and stored, in accordance with workplace procedures and manufacturers' specifications

4.4 Work completion details are finalised, in accordance with workplace procedures

Foundation Skills

Foundation skills essential to performance are explicit in the performance criteria of this unit of competency.

Range of Conditions

Range is restricted to essential operating conditions and any other variables essential to the work environment.

Non-essential conditions may be found in the Companion Volume Implementation Guide.

Unit Mapping Information

This unit replaces and is equivalent to UEPOPS327B Monitor and maintain civil assets.

Links

Companion Volume implementation guides are found in VETNet - https://vetnet.gov.au/Pages/TrainingDocs.aspx?q=1715b9fa-e7bd-441c-bb8d-cf22c9c825a8

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Assessment Requirements for UEPOPS327 Monitor and maintain civil assets

Modification History

Release 1. This is the first release of this unit of competency in the UEP Generation Training Package.

Performance Evidence

Evidence required to demonstrate competence in this unit must be relevant to and satisfy all the requirements of the elements, performance criteria and range of conditions on at least two separate occasions and includes:

- applying Work, Health and Safety (WHS)/Occupational Health and Safety (OHS) requirements including:
  - emergency procedures
  - risk control measures
  - safe working practices
- communicating with personnel
- completing work
- identifying and selecting equipment and materials for civil asset maintenance work
- implementing legislation, industry standards, codes of practice and regulations
- interpreting manufacturers specifications and manuals
- maintaining civil assets
- monitoring civil assets
- planning work
- storing and maintaining tools and equipment
- using monitoring and maintenance procedures

Knowledge Evidence

Evidence required to demonstrate competence in this unit must be relevant to and satisfy all the requirements of the elements, performance criteria and range of conditions and includes knowledge of:

- layout of worksite and civil assets
- legislation, industry standards, codes of practice and regulations
- manufacturers' specifications and manuals
- monitoring and maintenance techniques
- principles of hydroelectric generation
- typical arrangements of hydroelectric generation plant

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- WHS/OHS legislated requirements including:
  - emergency procedures
  - risk control measures
  - safe working practices
- workplace documentation
- workplace policies and procedures

Assessment Conditions

As a minimum, assessors must satisfy applicable regulatory requirements, which include requirements in the Standards for Registered Training Organisations current at the time of assessment.

As a minimum, assessment must satisfy applicable regulatory requirements, which include requirements in the Standards for Registered Training Organisations current at the time of assessment.

Assessment processes and techniques must be appropriate to the language, literacy and numeracy requirements of the work being performed and the needs of the candidate.

Assessment must occur in workplace operational situations. Where this is not appropriate, assessment must occur in simulated workplace operational situations that reflect workplace conditions.

Resources for assessment must include access to:

- a range of relevant exercises, case studies and/or other simulations
- relevant and appropriate materials, tools, equipment and personal protective equipment currently used in industry
- applicable documentation including workplace procedures, industry standards, equipment specifications, regulations, codes of practice and operation manuals.

Links

Companion Volume implementation guides are found in VETNet - https://vetnet.gov.au/Pages/TrainingDocs.aspx?q=1715b9fa-e7bd-441c-bb8d-cf22c9c825a8

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UEPOPS328 Undertake dam safety surveillance

Modification History

Release 1. This is the first release of this unit of competency in the UEP Generation Training Package.

Application

This unit involves the skills and knowledge required to conduct ongoing surveillance of water storage facilities to ensure structural integrity and water quality is maintained.

Hydropower relies on water stored in dams to create electricity therefore, the structural integrity of dams is essential to the smooth operation of hydro power generation systems and plant.

Competency in this unit requires the ability to plan and prepare for work, undertake dam safety surveillance, sample and record water quality and complete work. Individuals will, in general, work as an operator, in a power generation facility.

No licensing, legislative or certification requirements apply to this unit at the time of publication.

Note: Workplace practice

The application of the skills and knowledge described in this unit may require a licence or training permit to practice in the workplace where work is carried out on gas and electrical installations. Additional conditions may apply under state and territory legislative and regulatory licensing requirements.

Pre-requisite Unit

There are no prerequisite units.

Competency Field

Operations

Unit Sector

Electricity generation

Elements and Performance Criteria

ELEMENTS	PERFORMANCE CRITERIA
Elements describe the essential	Performance criteria describe the performance needed to

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outcomes.	demonstrate achievement of the element.
1 Plan and prepare for work	**1.1** Work, Health and Safety (WHS)/Occupational Health and Safety (OHS) regulations, legislative requirements, industry standards, codes of practice, manufacturers' specifications, environmental obligations and workplace procedures are identified, applied and monitored
	1.2 Work requirements are identified from work order and are confirmed with appropriate personnel or by site inspection, in accordance with workplace procedures
	1.3 Resources are obtained and inspected for compliance, in accordance with workplace procedures
	1.4 Potential hazards are identified and risk control measures are selected and implemented, in accordance with workplace procedures
	1.5 Work is sequenced and prioritised, in accordance with workplace procedures and site requirements
2 Conduct dam safety surveillance	**2.1** Surveillance of dam structures is conducted, in accordance with workplace procedures and guidelines
	2.2 Recordings of dam leakage are reported to appropriate personnel and external authorities, in accordance with workplace procedures and legislative requirements
	2.3 Special inspections are undertaken following abnormal dam events, in accordance with workplace procedures
3 Sample and record water quality	**3.1** Water samples are collected using appropriate equipment and techniques, in accordance with workplace procedures
	3.2 Water testing is performed using laboratory or field equipment, in accordance with workplace procedures
	3.3 Water test results are recorded and abnormal results are communicated to appropriate personnel, in accordance with workplace procedures
4 Complete work	**4.1** Documentation is updated, in accordance with workplace procedures
	4.2 Test equipment and tools are maintained and stored, in accordance with workplace procedures

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Foundation Skills

Foundation skills essential to performance are explicit in the performance criteria of this unit of competency.

Range of Conditions

Range is restricted to essential operating conditions and any other variables essential to the work environment.

Non-essential conditions may be found in the Companion Volume Implementation Guide.

Unit Mapping Information

This unit replaces and is equivalent to UEPOPS328B Undertake dam safety surveillance.

Links

Companion Volume implementation guides are found in VETNet - https://vetnet.gov.au/Pages/TrainingDocs.aspx?q=1715b9fa-e7bd-441c-bb8d-cf22c9c825a8

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Assessment Requirements for UEPOPS328 Undertake dam safety surveillance

Modification History

Release 1. This is the first release of this unit of competency in the UEP Generation Training Package.

Performance Evidence

Evidence required to demonstrate competence in this unit must be relevant to and satisfy all the requirements of the elements, performance criteria and range of conditions on at least two separate occasions and includes:

- applying Work, Health and Safety (WHS)/Occupational Health and Safety (OHS) requirements including:
  - emergency procedures
  - risk control measures
  - safe working practices
- communicating with personnel
- completing work
- identifying early warning signs and causes of dam failures
- implementing legislation, industry standards, codes of practice and regulations
- planning and preparing for work
- recognising early warning signs and causes of dam failures
- sampling, testing and recording water quality
- selecting and utilising equipment and materials to perform work
- undertaking dam safety surveillance including using associated equipment

Knowledge Evidence

Evidence required to demonstrate competence in this unit must be relevant to and satisfy all the requirements of the elements, performance criteria and range of conditions and includes knowledge of:

- dam types and characteristics
- early warning signs and causes of dam failures
- legislation, industry standards, codes of practice and regulations
- surveillance of hydroelectric dams and associated equipment
- typical arrangements of hydroelectric generation plant
- water sampling collection and testing
- WHS/OHS legislated requirements including:

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  - emergency procedures
  - risk control measures
  - safe working practices
- workplace documentation
- workplace policies and procedures

Assessment Conditions

As a minimum, assessors must satisfy applicable regulatory requirements, which include requirements in the Standards for Registered Training Organisations current at the time of assessment.

As a minimum, assessment must satisfy applicable regulatory requirements, which include requirements in the Standards for Registered Training Organisations current at the time of assessment.

Assessment processes and techniques must be appropriate to the language, literacy and numeracy requirements of the work being performed and the needs of the candidate.

Assessment must occur in workplace operational situations. Where this is not appropriate, assessment must occur in simulated workplace operational situations that reflect workplace conditions.

Resources for assessment must include access to:

- a range of relevant exercises, case studies and/or other simulations
- relevant and appropriate materials, tools, equipment and personal protective equipment currently used in industry
- applicable documentation including workplace procedures, industry standards, equipment specifications, regulations, codes of practice and operation manuals.

Links

Companion Volume implementation guides are found in VETNet - https://vetnet.gov.au/Pages/TrainingDocs.aspx?q=1715b9fa-e7bd-441c-bb8d-cf22c9c825a8

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UEPOPS329 Operate and monitor auxiliary steam systems

Modification History

Release 1. This is the first release of this unit of competency in the UEP Generation Training Package.

Application

This unit involves the skills and knowledge required to operate, inspect and monitor auxiliary steam systems in a power generation facility.

The function of an auxiliary steam system is to deliver ancillary steam, as required, to ensure the smooth operation of plant and equipment. Auxiliaries serve to keep steam water cycles safely circulating, and to return it to its thermodynamic starting point.

Competency in this unit requires the ability to plan work, operate auxiliary steam system plant, test auxiliary steam system plant, analyse auxiliary steam system plant faults, monitor and inspect auxiliary steam system plant and the completion of all documentation. Individuals will, in general, work under supervision, in a power generation facility as an operator.

Power generation plant operators are typically trained and authorised to isolate, prepare plant and issue permits to work.

No licensing, legislative or certification requirements apply to this unit at the time of publication.

Note: Workplace practice

The application of the skills and knowledge described in this unit may require a licence or training permit to practice in the workplace where work is carried out on gas and electrical installations. Additional conditions may apply under state and territory legislative and regulatory licensing requirements.

Pre-requisite Unit

There are no prerequisite units.

Competency Field

Operations

Unit Sector

Electricity generation

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Elements and Performance Criteria

ELEMENTS	PERFORMANCE CRITERIA
Elements describe the essential outcomes.	Performance criteria describe the performance needed to demonstrate achievement of the element.
1 Plan and prepare for auxiliary steam system plant operation	**1.1** Safety issues related to operating and monitoring auxiliary steam system plant are identified, in accordance with workplace procedures and Work, Health and Safety (WHS)/Occupational Health and Safety (OHS) regulations and legislative requirements
	1.2 Work requirements including permits to work are identified, in accordance with workplace procedures, and from relevant personnel and documentation
	1.3 Documentation to determine auxiliary steam system plant status is assessed and evaluated, in accordance with workplace procedures
	1.4 Inspection, preoperational checks and field preparation for auxiliary steam system plant service are carried out, in accordance with workplace procedures and manufacturers' recommendations
	1.5 Auxiliary steam system plant operational prerequisites are established, in accordance with workplace procedures and manufacturers' recommendations
	1.6 Sequence for recommissioning of auxiliary steam system plant is determined, in accordance with workplace procedures and site requirements
2 Operate auxiliary steam system plant	**2.1** Auxiliary steam system plant is operated, in accordance with workplace procedures and manufacturers' operating recommendations
	2.2 Auxiliary steam system plant is monitored and observed, in accordance with workplace procedures, to detect deviations from normal operating conditions
	2.3 Corrective actions are taken to rectify auxiliary steam system plant abnormalities, in accordance with workplace procedures, industry standards and site requirements
3 Test auxiliary steam system plant operation	**3.1** Operational tests are performed, in accordance with workplace procedures

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	3.2	Auxiliary steam system plant is observed for correct operational response, in accordance with workplace procedures
	3.3	Corrective action is taken when response does not meet with documentation, auxiliary steam system plant integrity or personnel safety requirements
	3.4	Auxiliary steam system plant is returned to required operational status upon completion of testing, in accordance with workplace procedures
4 Analyse auxiliary steam system plant faults	**4.1**	Causes of abnormal auxiliary steam system plant operating conditions are identified, in accordance with workplace procedures, and by analysing technical and operational information
	4.2	Corrective action is taken, in accordance with workplace procedures
	4.3	Auxiliary steam system plant integrity and personnel safety is maintained, in accordance with workplace procedures, and in consultation with appropriate personnel and technical and operational documentation
5 Monitor and inspect auxiliary steam system plant	**5.1**	Auxiliary steam system plant to be monitored and inspected is physically identified, in accordance with workplace procedures
	5.2	Auxiliary steam system plant is monitored and inspected, in accordance with workplace procedures, to detect deviations from normal operating conditions of the plant
	5.3	Corrective action is taken, in accordance with workplace procedures
	5.4	Appropriate personnel are notified, in accordance with workplace procedures, when defects are detected
6 Complete documentation	**6.1**	Auxiliary steam system plant problems, movements, and status are reported, in accordance with workplace procedures
	6.2	Documentation is updated, in accordance with workplace procedures

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Foundation Skills

Foundation skills essential to performance are explicit in the performance criteria of this unit of competency.

Range of Conditions

Range is restricted to essential operating conditions and any other variables essential to the work environment.

Non-essential conditions may be found in the Companion Volume Implementation Guide.

Unit Mapping Information

This unit replaces and is equivalent to UEPOPS329B Operate and monitor auxiliary steam systems.

Links

Companion Volume implementation guides are found in VETNet - https://vetnet.gov.au/Pages/TrainingDocs.aspx?q=1715b9fa-e7bd-441c-bb8d-cf22c9c825a8

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Assessment Requirements for UEPOPS329 Operate and monitor auxiliary steam systems

Modification History

Release 1. This is the first release of this unit of competency in the UEP Generation Training Package.

Performance Evidence

Evidence required to demonstrate competence in this unit must be relevant to and satisfy all the requirements of the elements, performance criteria and range of conditions on at least two separate occasions and includes:

- analysing auxiliary steam system plant faults using data analysis techniques and tools
- applying Work, Health and Safety (WHS)/Occupational Health and Safety (OHS) requirements including:
  - emergency procedures
  - risk control measures
  - safe working practices
- communicating with personnel
- completing documentation
- coordinating the operation of auxiliary steam system equipment
- identifying auxiliary steam system plant status
- implementing legislation, industry standards, codes of practice and regulations
- interpreting manufacturers' specifications and manuals
- monitoring and inspecting auxiliary steam system plant operation
- operating auxiliary steam system plant
- organising resources
- performing isolations
- preparing and planning work
- recognising and responding to abnormal auxiliary steam system plant operating conditions
- testing auxiliary steam system plant operationally using diagnostic and testing techniques
- using permit to work system
- working with auxiliary steam system plant and/or equipment

Knowledge Evidence

Evidence required to demonstrate competence in this unit must be relevant to and satisfy all the requirements of the elements, performance criteria and range of conditions and includes knowledge of:

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- auxiliary steam system plant and equipment, its location and operating parameters
- auxiliary steam system plant status
- characteristic auxiliary steam plant faults and corrective actions
- isolations
- legislation, industry standards, codes of practice and regulations
- manufacturers' specifications and manuals
- permit to work system
- typical arrangements of power production plant
- workplace documentation
- workplace policies and procedures
- WHS/OHS legislated requirements including:
  - emergency procedures
  - risk control measures
  - safe working practices

Assessment Conditions

As a minimum, assessors must satisfy applicable regulatory requirements, which include requirements in the Standards for Registered Training Organisations current at the time of assessment.

As a minimum, assessment must satisfy applicable regulatory requirements, which include requirements in the Standards for Registered Training Organisations current at the time of assessment.

Assessment processes and techniques must be appropriate to the language, literacy and numeracy requirements of the work being performed and the needs of the candidate.

Assessment must occur in workplace operational situations. Where this is not appropriate, assessment must occur in simulated workplace operational situations that reflect workplace conditions.

Resources for assessment must include access to:

- a range of relevant exercises, case studies and/or other simulations
- relevant and appropriate materials, tools, equipment and personal protective equipment currently used in industry
- applicable documentation including workplace procedures, industry standards, equipment specifications, regulations, codes of practice and operation manuals.

Links

Companion Volume implementation guides are found in VETNet - https://vetnet.gov.au/Pages/TrainingDocs.aspx?q=1715b9fa-e7bd-441c-bb8d-cf22c9c825a8

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UEPOPS330 Operate and monitor heat exchangers and cooling systems

Modification History

Release 1. This is the first release of this unit of competency in the UEP Generation Training Package.

Application

This unit involves the skills and knowledge required to operate and monitor heat exchangers and cooling systems within power generation facilities.

A heat exchanger is used in power generation facilities to maintain efficiency in the steam and water cycle. The cooling system is used to reduce the heat from power generation plant and/or equipment.

Competency in this unit requires the ability to plan work, operate heat exchangers and cooling system plant, test heat exchangers and cooling system plant, analyse heat exchangers and cooling system plant faults, monitor and inspect heat exchangers and cooling system plant and the completion of all documentation. Individuals will, in general, work under supervision, in a power plant as an operator.

Power generation plant operators are typically trained and authorised to isolate, prepare plant and issue permits to work.

No licensing, legislative or certification requirements apply to this unit at the time of publication.

Note: Workplace practice

The application of the skills and knowledge described in this unit may require a licence or training permit to practice in the workplace where work is carried out on gas and electrical installations. Additional conditions may apply under state and territory legislative and regulatory licensing requirements.

Pre-requisite Unit

There are no prerequisite units.

Competency Field

Operations

Unit Sector

Electricity generation

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Elements and Performance Criteria

ELEMENTS	PERFORMANCE CRITERIA
Elements describe the essential outcomes.	Performance criteria describe the performance needed to demonstrate achievement of the element.
1 Plan and prepare work	**1.1** Safety issues related to operating and monitoring heat exchangers and cooling system plant are identified, in accordance with workplace procedures and Work, Health and Safety (WHS)/Occupational Health and Safety(OHS) regulations and legislative requirements
	1.2 Work requirements are identified, in accordance with workplace procedures, from relevant personnel and documentation
	1.3 Documentation to determine heat exchangers and cooling system plant status is assessed and evaluated, in accordance with workplace procedures
	1.4 Inspection and field preparation for heat exchangers and cooling system plant service is carried out, in accordance with workplace procedures and manufacturers' recommendations
	1.5 Heat exchangers and cooling system plant operational prerequisites are established, in accordance with workplace procedures and manufacturers' recommendations
	1.6 Sequence for recommissioning of heat exchangers and cooling system plant is determined, in accordance with workplace procedures and site requirements
2 Operate heat exchangers/cooling system plant	**2.1** Heat exchangers and cooling system plant is operated, in accordance with workplace procedures and manufacturers' operating recommendations
	2.2 Heat exchangers and cooling system plant is monitored and observed, in accordance with workplace procedures, to detect deviations from normal operating conditions
	2.3 Corrective actions are taken to rectify heat exchangers and cooling system plant abnormalities, in accordance with workplace procedures and manufacturers' recommendations
3 Test heat exchangers/cooling system	**3.1** Operational tests are performed, in accordance with

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plant operation		workplace procedures
	3.2	Heat exchangers and cooling system plant is observed, in accordance with workplace procedures for correct operational response
	3.3	Corrective action is taken when heat exchangers and cooling system plant response does not meet with documentation, plant integrity or personnel safety requirements
	3.4	Heat exchangers and cooling system plant is returned to required operational status upon completion of testing, in accordance with workplace procedures
4 Analyse heat exchangers/cooling systems plant faults	**4.1**	Causes of abnormal heat exchangers and cooling system plant operating conditions are identified, in accordance with workplace procedures, and by analysing technical and operational information
	4.2	Corrective action is taken, in accordance with workplace procedures
5 Monitor and inspect heat exchangers/cooling system plant	**5.1**	Heat exchangers and cooling system plant to be monitored and inspected is physically identified, in accordance with workplace procedures
	5.2	Heat exchangers and cooling system plant is monitored and inspected, in accordance with workplace procedures, for normal operation or to detect deviations
	5.3	Corrective action is taken, in accordance with workplace procedures
	5.4	Appropriate personnel are notified, in accordance with workplace procedures, when defects are detected
6 Complete documentation	**6.1**	Heat exchangers and cooling system plant problems, movements, and status are reported, in accordance with workplace procedures
	6.2	Documentation is updated, in accordance with workplace procedures

Foundation Skills

Foundation skills essential to performance are explicit in the performance criteria of this unit of competency.

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Range of Conditions

Range is restricted to essential operating conditions and any other variables essential to the work environment.

Non-essential conditions may be found in the Companion Volume Implementation Guide.

Unit Mapping Information

This unit replaces and is equivalent to UEPOPS330B Operate and monitor heat exchangers.

Links

Companion Volume implementation guides are found in VETNet - https://vetnet.gov.au/Pages/TrainingDocs.aspx?q=1715b9fa-e7bd-441c-bb8d-cf22c9c825a8

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Assessment Requirements for UEPOPS330 Operate and monitor heat exchangers and cooling systems

Modification History

Release 1. This is the first release of this unit of competency in the UEP Generation Training Package.

Performance Evidence

Evidence required to demonstrate competence in this unit must be relevant to and satisfy all the requirements of the elements, performance criteria and range of conditions on at least two separate occasions and includes:

- analysing heat exchangers and cooling system plant faults using data analysis techniques and tools
- applying Work, Health and Safety (WHS)/Occupational Health and Safety (OHS) requirements including:
  - emergency procedures
  - risk control measures
  - safe work practices
- communicate with personnel
- completing documentation
- identifying heat exchangers and cooling system plant status
- implementing legislation, industry standards, codes of practice and regulations
- monitoring and inspecting heat exchangers and cooling system plant
- operating heat exchangers and cooling system plant
- organising resources
- preparing and planning work
- recognising and responding to abnormal heat exchangers and cooling system plant operating conditions
- testing heat exchangers and cooling system plant operationally using diagnostic and testing techniques
- utilising the permit to work system
- working with heat exchangers and cooling system plant and/or equipment for operation

Knowledge Evidence

Evidence required to demonstrate competence in this unit must be relevant to and satisfy all the requirements of the elements, performance criteria and range of conditions and includes knowledge of:

- heat exchangers and cooling system plant and equipment, its location and operating

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parameters
- heat exchangers and cooling system plant status
- legislation, industry standards, codes of practice and regulations
- manufacturers' specifications and manuals
- permit to work system
- typical arrangements of power production plant
- WHS/OHS legislated requirements including:
  - emergency procedures
  - risk control measures
  - safe work practices
- workplace documentation
- workplace policies and procedures

Assessment Conditions

As a minimum, assessors must satisfy applicable regulatory requirements, which include requirements in the Standards for Registered Training Organisations current at the time of assessment.

As a minimum, assessment must satisfy applicable regulatory requirements, which include requirements in the Standards for Registered Training Organisations current at the time of assessment.

Assessment processes and techniques must be appropriate to the language, literacy and numeracy requirements of the work being performed and the needs of the candidate.

Assessment must occur in workplace operational situations. Where this is not appropriate, assessment must occur in simulated workplace operational situations that reflect workplace conditions.

Resources for assessment must include access to:

- a range of relevant exercises, case studies and/or other simulations
- relevant and appropriate materials, tools, equipment and personal protective equipment currently used in industry
- applicable documentation including workplace procedures, industry standards, equipment specifications, regulations, codes of practice and operation manuals.

Links

Companion Volume implementation guides are found in VETNet - https://vetnet.gov.au/Pages/TrainingDocs.aspx?q=1715b9fa-e7bd-441c-bb8d-cf22c9c825a8

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UEPOPS331 Operate and monitor water systems (condensate and feedwater)

Modification History

Release 1. This is the first release of this unit of competency in the UEP Generation Training Package.

Application

This unit involves the skills and knowledge required to operate, inspect and monitor water systems (condensate and feedwater).

Water systems are used to supply high quality water to the generator and to heat water. Between the condenser and feedwater pump, the water is called condensate and between the feedwater pump and the generator the water is called feedwater.

Competency in this unit requires the ability to plan work, operate water system (condensate and feedwater) plant, test water system plant, analyse water system plant faults, monitor and inspect water system plant and the completion of all documentation. Individuals will, in general, work as an operator in a power generation plant.

Power generation plant operators are typically trained and authorised to isolate, prepare plant and issue permits to work.

No licensing, legislative or certification requirements apply to this unit at the time of publication.

Note: Workplace practice

The application of the skills and knowledge described in this unit may require a licence or training permit to practice in the workplace where work is carried out on gas and electrical installations. Additional conditions may apply under state and territory legislative and regulatory licensing requirements.

Pre-requisite Unit

There are no prerequisite units.

Competency Field

Operations

Unit Sector

Electricity generation

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Elements and Performance Criteria

ELEMENTS	PERFORMANCE CRITERIA
Elements describe the essential outcomes.	Performance criteria describe the performance needed to demonstrate achievement of the element.
1 Plan and prepare for water systems plant operation	**1.1** Safety issues related to operating and monitoring water system plant are identified, in accordance with workplace procedures and Work, Health and Safety (WHS)/Occupational Health and Safety (OHS) regulations and legislative requirements
	1.2 Work requirements including permit to work are identified, in accordance with workplace procedures, from relevant personnel and documentation
	1.3 Documentation to determine water system plant status is assessed and evaluated, in accordance with workplace procedures
	1.4 Inspection, preoperational checks and field preparation for water system plant service are carried out, in accordance with workplace procedures and manufacturers' recommendations
	1.5 Water system plant operational prerequisites are established, in accordance with workplace procedures and manufacturers' recommendations
	1.6 Sequence for recommissioning of water system plant is determined, in accordance with workplace procedures and site requirements
2 Operate water system plant	**2.1** Water system plant is operated, in accordance with workplace procedures and manufacturers' operating recommendation
	2.2 Water system plant is monitored and observed, in accordance with workplace procedures, to detect deviations from normal operating conditions
	2.3 Corrective actions are taken to rectify water system abnormalities, in accordance with workplace procedures, industry standards and site requirements
3 Test water system plant operation	**3.1** Operational tests are performed, in accordance with workplace procedures

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	3.2	Water system plant is observed for correct operational response, in accordance with workplace procedures
	3.3	Corrective action is taken when response does not meet with documentation, water system plant integrity or personnel safety requirements
	3.4	Water system plant is returned to required operational status upon completion of testing, in accordance with workplace procedures
4 Analyse water system plant faults	**4.1**	Causes of abnormal water system plant operating conditions are identified, in accordance with workplace procedures, and by analysing technical and operational information
	4.2	Corrective action is taken, in accordance with workplace procedures
	4.3	Water system plant integrity and personnel safety is maintained, in accordance with workplace procedures, and in consultation with appropriate personnel and technical and operational documentation
5 Monitor and inspect water system plant	**5.1**	Water system plant to be monitored and inspected is physically identified, in accordance with workplace procedures
	5.2	Water system plant is monitored and inspected, in accordance with workplace procedures, for normal operation or to detect deviations
	5.3	Corrective action is taken, in accordance with workplace procedures
	5.4	Appropriate personnel are notified when defects are detected, in accordance with workplace procedures
6 Complete documentation	**6.1**	Water system plant problems, movements and status are reported, in accordance with workplace procedures
	6.2	Documentation is updated, in accordance with workplace procedures

Foundation Skills

Foundation skills essential to performance are explicit in the performance criteria of this unit of competency.

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Range of Conditions

Range is restricted to essential operating conditions and any other variables essential to the work environment.

Non-essential conditions may be found in the Companion Volume Implementation Guide.

Unit Mapping Information

This unit replaces and is equivalent to UEPOPS331B Operate and monitor water systems (condensate and feedwater).

Links

Companion Volume implementation guides are found in VETNet - https://vetnet.gov.au/Pages/TrainingDocs.aspx?q=1715b9fa-e7bd-441c-bb8d-cf22c9c825a8

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Assessment Requirements for UEPOPS331 Operate and monitor water systems (condensate and feedwater)

Modification History

Release 1. This is the first release of this unit of competency in the UEP Generation Training Package.

Performance Evidence

Evidence required to demonstrate competence in this unit must be relevant to and satisfy all the requirements of the elements, performance criteria and range of conditions on at least two separate occasions and includes:

- analysing water system plant faults using data analysis techniques and tools
- applying Work, Health and Safety (WHS)/Occupational Health and Safety (OHS) requirements including:
  - emergency procedures
  - risk control measures
  - safe work practices
- communicating with personnel
- completing documentation using recording procedures
- identifying water system plant status
- monitoring and inspecting water system plant operations
- operating water system
- organising resources
- performing isolations
- preparing and planning work
- recognising and responding to abnormal water system plant operating conditions
- testing water system (condensate and feedwater) plant operationally using diagnostic and test techniques
- using permit to work system
- working with water system plant and equipment

Knowledge Evidence

Evidence required to demonstrate competence in this unit must be relevant to and satisfy all the requirements of the elements, performance criteria and range of conditions and includes knowledge of:

- characteristic water system plant faults and corrective actions
- feedwater system plant types and characteristics including feedwater chemical treatments
- isolations

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- legislation, industry standards, codes of practice and regulations
- manufacturers' specifications and manuals
- permit to work system
- typical arrangements of power production plant
- water system plant and equipment, its location and operating parameters
- water system plant status
- WHS/OHS legislated requirements including:
  - emergency procedures
  - risk control measures
  - safe work practices
- workplace documentation
- workplace policies and procedures

Assessment Conditions

As a minimum, assessors must satisfy applicable regulatory requirements, which include requirements in the Standards for Registered Training Organisations current at the time of assessment.

As a minimum, assessment must satisfy applicable regulatory requirements, which include requirements in the Standards for Registered Training Organisations current at the time of assessment.

Assessment processes and techniques must be appropriate to the language, literacy and numeracy requirements of the work being performed and the needs of the candidate.

Assessment must occur in workplace operational situations. Where this is not appropriate, assessment must occur in simulated workplace operational situations that reflect workplace conditions.

Resources for assessment must include access to:

- a range of relevant exercises, case studies and/or other simulations
- relevant and appropriate materials, tools, equipment and personal protective equipment currently used in industry
- applicable documentation including workplace procedures, industry standards, equipment specifications, regulations, codes of practice and operation manuals.

Links

Companion Volume implementation guides are found in VETNet - https://vetnet.gov.au/Pages/TrainingDocs.aspx?q=1715b9fa-e7bd-441c-bb8d-cf22c9c825a8

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UEPOPS332 Operate and monitor condenser and auxiliary cooling systems

Modification History

Release 1. This is the first release of this unit of competency in the UEP Generation Training Package.

Application

This unit involves the skills and knowledge required to operate, inspect and monitor condenser and auxiliary cooling systems.

Auxiliary cooling systems deliver cool water or air, as required, to reduce the heat from plant and equipment in power generation facilities. The condenser is used to change gas to liquid by cooling it.

Competency in this unit requires the ability to plan work, operate condenser cooling system plant, test condenser cooling system plant, analyse condenser cooling system plant faults, monitor and inspect condenser cooling system plant and the completion of all documentation. Individuals will, in general, work under supervision, in a power generation facility as an operator.

Power generation plant operators are typically trained and authorised to isolate, prepare plant and issue permits to work.

No licensing, legislative or certification requirements apply to this unit at the time of publication.

Note: Workplace practice

The application of the skills and knowledge described in this unit may require a licence or training permit to practice in the workplace where work is carried out on gas and electrical installations. Additional conditions may apply under state and territory legislative and regulatory licensing requirements.

Pre-requisite Unit

There are no prerequisite units.

Competency Field

Operations

Unit Sector

Electricity generation

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Elements and Performance Criteria

ELEMENTS	PERFORMANCE CRITERIA
Elements describe the essential outcomes.	Performance criteria describe the performance needed to demonstrate achievement of the element.
1 Plan and prepare work	**1.1** Safety issues related to operating and monitoring condenser and cooling system plant are identified, in accordance with workplace procedures and Work, Health and Safety (WHS)/Occupational Health and Safety (OHS) regulations and legislative requirements
	1.2 Work requirements are identified, in accordance with workplace procedures, from relevant personnel and documentation
	1.3 Documentation to determine condenser and cooling system plant status is assessed and evaluated, in accordance with workplace procedures
	1.4 Inspection, preoperational checks and field preparation for condenser and cooling system plant service are carried out, in accordance with workplace procedures and manufacturers' recommendations
	1.5 Condenser and cooling system plant operational prerequisites are established, in accordance with workplace procedures and manufacturers' recommendations
	1.6 Sequence for recommissioning of condenser and cooling system plant is determined to suit existing circumstances, in accordance with workplace procedures and site requirements
2 Operate condenser and cooling system plant	**2.1** Condenser and cooling system plant is operated, in accordance with workplace procedures and manufacturers' operating recommendations
	2.2 Condenser cooling system plant is monitored and observed, in accordance with workplace procedures, to detect deviations from normal operating conditions
	2.3 Corrective actions are taken to rectify condenser and cooling system plant abnormalities, in accordance with workplace procedures, industry standards and site requirements

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3	**Test condenser and cooling system plant**	**3.1** Operational tests are performed, in accordance with workplace procedures
		3.2 Condenser cooling system plant is observed, in accordance with workplace procedures, for correct operational response
		3.3 Corrective action is taken, in accordance with workplace procedures, when response does not meet with documentation, condenser and cooling system plant integrity or personnel safety requirements
		3.4 Condenser and cooling system plant is returned to required operational status upon completion of testing, in accordance with workplace procedures
4	**Analyse condenser and cooling system plant faults**	**4.1** Causes of abnormal condenser and cooling system plant operating conditions are identified, in accordance with workplace procedures, and by analysing technical and operational information
		4.2 Corrective action is taken, in accordance with workplace procedures
		4.3 Condenser and cooling system plant integrity and personnel safety is maintained, in accordance with workplace procedures, and in consultation with appropriate personnel and technical and operational documentation
5	**Monitor and inspect condenser and cooling system plant**	**5.1** Condenser and cooling system plant to be monitored and inspected is physically identified, in accordance with workplace procedures
		5.2 Condenser and cooling system plant is monitored and inspected, in accordance with workplace procedures, for normal operation or to detect deviations
		5.3 Corrective action is taken, in accordance with workplace procedure
		5.4 Appropriate personnel are notified when defects are detected, in accordance with workplace procedures
6	**Complete documentation**	**6.1** Condenser and cooling system plant problems, movements, abnormalities and status are reported, in accordance with workplace procedures
		6.2 Documentation is updated, in accordance with

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workplace procedures

Foundation Skills

Foundation skills essential to performance are explicit in the performance criteria of this unit of competency.

Range of Conditions

Range is restricted to essential operating conditions and any other variables essential to the work environment.

Non-essential conditions may be found in the Companion Volume Implementation Guide.

Unit Mapping Information

This unit replaces and is equivalent to UEPOPS332B Operate and monitor condensing and cooling systems.

Links

Companion Volume implementation guides are found in VETNet - https://vetnet.gov.au/Pages/TrainingDocs.aspx?q=1715b9fa-e7bd-441c-bb8d-cf22c9c825a8

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Assessment Requirements for UEPOPS332 Operate and monitor condenser and auxiliary cooling systems

Modification History

Release 1. This is the first release of this unit of competency in the UEP Generation Training Package.

Performance Evidence

Evidence required to demonstrate competence in this unit must be relevant to and satisfy all the requirements of the elements, performance criteria and range of conditions on at least two separate occasions and includes:

- analysing condenser and cooling system plant faults using data analysis techniques and tools
- applying Work, Health and Safety (WHS)/Occupational Health and Safety (OHS) requirements including:
  - emergency procedures
  - risk control measures
  - safe working practices
- communicating with personnel
- completing documentation
- identifying condenser and cooling system plant status
- implementing legislation, industry standards, codes of practice and regulations
- interpreting manufacturers' specifications and manuals
- monitoring and inspecting condenser and cooling system plant operations
- operating condenser and auxiliary cooling water system including plant and equipment
- organising resources
- preparing and planning work
- recognising and responding to abnormal condenser and cooling system plant operating conditions
- testing condenser and cooling system plant operationally using diagnostic and test techniques
- using permit to work system

Knowledge Evidence

Evidence required to demonstrate competence in this unit must be relevant to and satisfy all the requirements of the elements, performance criteria and range of conditions and includes knowledge of:

- condenser and cooling system plant and equipment, its location and operating parameters
- condenser and cooling system plant status
- legislation, industry standards, codes of practice and regulations

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- manufacturers' specifications and manuals
- permit to work system
- typical arrangements of power production plant
- WHS/OHS legislated requirements including:
  - emergency procedures
  - risk control measures
  - safe working practices
- workplace documentation
- workplace policies and procedures

Assessment Conditions

As a minimum, assessors must satisfy applicable regulatory requirements, which include requirements in the Standards for Registered Training Organisations current at the time of assessment.

As a minimum, assessment must satisfy applicable regulatory requirements, which include requirements in the Standards for Registered Training Organisations current at the time of assessment.

Assessment processes and techniques must be appropriate to the language, literacy and numeracy requirements of the work being performed and the needs of the candidate.

Assessment must occur in workplace operational situations. Where this is not appropriate, assessment must occur in simulated workplace operational situations that reflect workplace conditions.

Resources for assessment must include access to:

- a range of relevant exercises, case studies and/or other simulations
- relevant and appropriate materials, tools, equipment and personal protective equipment currently used in industry
- applicable documentation including workplace procedures, industry standards, equipment specifications, regulations, codes of practice and operation manuals.

Links

Companion Volume implementation guides are found in VETNet - https://vetnet.gov.au/Pages/TrainingDocs.aspx?q=1715b9fa-e7bd-441c-bb8d-cf22c9c825a8

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UEPOPS333 Operate and monitor HRSG hot gas control system

Modification History

Release 1. This is the first release of this unit of competency in the UEP Generation Training Package.

Application

This unit involves the skills and knowledge required to operate, inspect and monitor Heat Recovery Steam Generator (HRSG) hot gas control systems.

HRSGs are used to recover heat from a hot gas streams which is then supplied to a steam turbine to generate additional electric power. The hot gas control system is used operate the internal gas return and/or bypass system in the HRSG.

Competency in this unit requires the ability to plan work, operate heat recovery steam generator plant, test heat recovery steam generator plant, analyse heat recovery steam generator plant faults, monitor and inspect heat recovery steam generator plant and complete all documentation. Individuals will, in general, work under supervision, in a power generation facility as an operator.

Power generation plant operators are typically trained and authorised to isolate, prepare plant and issue permits to work.

No licensing, legislative or certification requirements apply to this unit at the time of publication.

Note: Workplace practice

The application of the skills and knowledge described in this unit may require a licence or training permit to practice in the workplace where work is carried out on gas and electrical installations. Additional conditions may apply under state and territory legislative and regulatory licensing requirements.

Pre-requisite Unit

There are no prerequisite units.

Competency Field

Operations

Unit Sector

Electricity generation

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Elements and Performance Criteria

ELEMENTS	PERFORMANCE CRITERIA
Elements describe the essential outcomes.	Performance criteria describe the performance needed to demonstrate achievement of the element.
1 Plan and prepare work	**1.1** Safety issues related to operating and monitoring Heat Recovery Steam Generator (HRSG) hot gas control system plant is identified, in accordance with workplace procedures and Work, Health and Safety (WHS)/Occupational Health and Safety (OHS) regulations and legislative requirements
	1.2 Work requirements are identified, in accordance with workplace procedures, and from appropriate personnel and documentation
	1.3 Documentation to determine HRSG hot gas control system plant status is assessed and evaluated, in accordance with workplace procedures
	1.4 Inspection and field preparation for HRSG hot gas control system plant service is carried out, in accordance with workplace procedures and manufacturers' recommendations
	1.5 HRSG hot gas control system plant operational prerequisites are established, in accordance with workplace procedures and manufacturers' recommendations
	1.6 Sequence for recommissioning of HRSG hot gas control system plant is determined to suit existing circumstances, in accordance with workplace procedures and site requirements
2 Operate HRSG hot gas control system plant	**2.1** HRSG hot gas control system plant is operated, in accordance with workplace procedures and manufacturers' operating recommendations
	2.2 HRSG hot gas control system plant is monitored and observed, in accordance with workplace procedures, to detect deviations from normal operating conditions
	2.3 Corrective actions are taken to rectify HRSG hot gas control system plant abnormalities, in accordance with workplace procedures and manufacturers' recommendations

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3	**Test HRSG hot gas control system plant operation**	**3.1** Operational tests are performed, in accordance with workplace procedures
		3.2 HRSG hot gas control system plant is observed for correct operational response, in accordance with workplace procedures
		3.3 Corrective action is taken, in accordance with workplace procedures, when response, does not meet with documentation, HRSG hot gas control system plant integrity or personnel safety requirements
		3.4 HRSG hot gas control system plant is returned to required operational status upon completion of test, in accordance with workplace procedures
4	**Analyse HRSG hot gas control system plant faults**	**4.1** Cause of abnormal HRSG hot gas control system plant operating conditions are identified, in accordance with workplace procedures, and by analysing technical and operational information
		4.2 Corrective action is taken, in accordance with workplace procedures
		4.3 HRSG hot gas control system plant integrity and personnel safety is maintained, in accordance with workplace procedures, and in consultation with appropriate personnel and technical and operational documentation
5	**Monitor and inspect HRSG hot gas control system plant**	**5.1** HRSG hot gas control system plant to be monitored or inspected is physically identified, in accordance with workplace procedures
		5.2 HRSG hot gas control system plant is monitored or inspected, in accordance with workplace procedures, for normal operation or to detect deviations
		5.3 Corrective action is taken, in accordance with workplace procedures
6	**Complete documentation**	**6.1** HRSG hot gas control system plant problems, movements, abnormalities and status are reported, in accordance with workplace procedures
		6.2 Documentation is updated, in accordance with workplace procedures

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Foundation Skills

Foundation skills essential to performance are explicit in the performance criteria of this unit of competency.

Range of Conditions

Range is restricted to essential operating conditions and any other variables essential to the work environment.

Non-essential conditions may be found in the Companion Volume Implementation Guide.

Unit Mapping Information

This unit replaces and is equivalent to UEPOPS333B Operate and monitor H.R.S.G. hot gas control system.

Links

Companion Volume implementation guides are found in VETNet - https://vetnet.gov.au/Pages/TrainingDocs.aspx?q=1715b9fa-e7bd-441c-bb8d-cf22c9c825a8

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Assessment Requirements for UEPOPS333 Operate and monitor HRSG hot gas control system

Modification History

Release 1. This is the first release of this unit of competency in the UEP Generation Training Package.

Performance Evidence

Evidence required to demonstrate competence in this unit must be relevant to and satisfy all the requirements of the elements, performance criteria and range of conditions on at least two separate occasions and includes:

- analysing HRSG hot gas control system plant faults using data analysis techniques and tools
- applying Work, Health and Safety (WHS)/Occupational Health and Safety (OHS) requirements including:
  - emergency procedures
  - risk control measures
  - safe working practices
- communicating with personnel
- completing documentation using recording procedures
- identifying HRSG hot gas control system plant status
- implementing legislation, industry standards, codes of practice and regulations
- interpreting manufacturers' specifications and manuals
- monitoring and inspecting HRSG hot gas control system plant operations
- operating HRSG hot gas control system
- organising resources
- preparing and planning work
- recognising and responding to abnormal HRSG hot gas control system plant operating conditions
- testing Heat Recovery Steam Generator (HRSG) hot gas control system plant operationally using diagnostic and test techniques
- using permit to work system
- working with HRSG hot gas control system plant and/or equipment

Knowledge Evidence

Evidence required to demonstrate competence in this unit must be relevant to and satisfy all the requirements of the elements, performance criteria and range of conditions and includes knowledge of:

- HRSG hot gas control system plant and equipment, its location and operating parameters

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- HRSG hot gas control system plant status
- legislation, industry standards, codes of practice and regulations
- manufacturers' specifications and manuals
- Permit to work system
- typical arrangements of power production plant
- WHS/OHS legislated requirements including:
  - emergency procedures
  - risk control measures
  - safe working practices
- workplace documentation
- workplace policies and procedures

Assessment Conditions

As a minimum, assessors must satisfy applicable regulatory requirements, which include requirements in the Standards for Registered Training Organisations current at the time of assessment.

As a minimum, assessment must satisfy applicable regulatory requirements, which include requirements in the Standards for Registered Training Organisations current at the time of assessment.

Assessment processes and techniques must be appropriate to the language, literacy and numeracy requirements of the work being performed and the needs of the candidate.

Assessment must occur in workplace operational situations. Where this is not appropriate, assessment must occur in simulated workplace operational situations that reflect workplace conditions.

Resources for assessment must include access to:

- a range of relevant exercises, case studies and/or other simulations
- relevant and appropriate materials, tools, equipment and personal protective equipment currently used in industry
- applicable documentation including workplace procedures, industry standards, equipment specifications, regulations, codes of practice and operation manuals.

Links

Companion Volume implementation guides are found in VETNet - https://vetnet.gov.au/Pages/TrainingDocs.aspx?q=1715b9fa-e7bd-441c-bb8d-cf22c9c825a8

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UEPOPS335 Operate a hydro generator synchronous condenser pump unit

Modification History

Release 1. This is the first release of this unit of competency in the UEP Generation Training Package.

Application

This unit involves the skills and knowledge required to start up, maintain a steady state of running and then shutdown a hydro unit operating either as a generator, synchronous condenser or pump.

Using synchronous condenser operations in hydro generation facilities can improve the quality of electric power being supplied, and it assists in stabilising the network during faults.

Competency in this unit requires the ability to plan and prepare work and to operate, test, analyse and report on hydro generator synchronous condenser plant. Individuals will, in general, work under supervision, in a power generation facility as an operator.

Power generation plant operators are typically trained and authorised to isolate, prepare plant and issue permits to work.

No licensing, legislative or certification requirements apply to this unit at the time of publication.

Note: Workplace practice

The application of the skills and knowledge described in this unit may require a licence or training permit to practice in the workplace where work is carried out on gas and electrical installations. Additional conditions may apply under state and territory legislative and regulatory licensing requirements.

Pre-requisite Unit

There are no prerequisite units.

Competency Field

Operations

Unit Sector

Electricity generation

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Elements and Performance Criteria

ELEMENTS	PERFORMANCE CRITERIA
Elements describe the essential outcomes.	Performance criteria describe the performance needed to demonstrate achievement of the element.
1 Plan and prepare work	**1.1** Safety issues are identified in accordance with Work, Health and Safety (WHS)/Occupational Health and Safety (OHS) regulations, industry standards and workplace procedures
	1.2 Work, hydro generator synchronous condenser plant and type of start requirements are identified from appropriate personnel and documentation, in accordance with workplace procedures
	1.3 Turbine running up and loading schedule are ascertained from relevant documentation, in accordance with workplace procedures
	1.4 Hydro generator synchronous condenser plant inspection, preoperational tests and field preparation for service are carried out, in accordance with manufacturers' recommendations and workplace procedures
	1.5 Hydro generator synchronous condenser plant operational prerequisites are established, in accordance with manufacturers' recommendations and workplace procedures
	1.6 Sequence for recommissioning of hydro generator synchronous condenser plant is determined, in accordance with workplace procedures
2 Operate hydro generator synchronous condenser plant	**2.1** Hydro generator synchronous condenser plant is operated, in accordance with workplace procedures and manufacturers' recommendations
	2.2 Hydro generator synchronous condenser plant is monitored, in accordance with workplace procedures, to detect deviations from normal operating conditions
	2.3 Corrective actions are taken to rectify abnormalities, in accordance with manufacturers' recommendations and workplace procedures
3 Test hydro generator synchronous condenser	**3.1** Tests are performed on hydro generator synchronous condenser plant, in accordance with workplace

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plant operation		procedures
	3.2	Corrective action is taken when response does not meet with documentation, hydro generator synchronous condenser plant integrity or personnel safety requirements
	3.3	Hydro generator synchronous condenser plant is returned to required operational status upon completion of testing, in accordance with workplace procedures
4 Analyse hydro generator plant faults	**4.1**	Cause of abnormal hydro generator synchronous condenser plant operating conditions are identified by analysing technical and operational information, in accordance with workplace procedures
	4.2	Hydro generator synchronous condenser plant integrity and personnel safety is maintained, in accordance with workplace procedures, through consultation with appropriate personnel and technical and operational documentation
	4.3	Appropriate personnel are notified when defects are detected, in accordance with workplace procedures
5 Complete documentation	**5.1**	Plant problems, movements and status are reported, in accordance with workplace procedures
	5.2	Documentation is updated, in accordance with workplace procedures

Foundation Skills

Foundation skills essential to performance are explicit in the performance criteria of this unit of competency.

Range of Conditions

Range is restricted to essential operating conditions and any other variables essential to the work environment.

Non-essential conditions may be found in the Companion Volume Implementation Guide.

Unit Mapping Information

This unit replaces and is equivalent to UEPOPS335B Operate a hydro generator synchronous condenser pump unit.

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Links

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Assessment Requirements for UEPOPS335 Operate a hydro generator synchronous condenser pump unit

Modification History

Release 1. This is the first release of this unit of competency in the UEP Generation Training Package.

Performance Evidence

Evidence required to demonstrate competence in this unit must be relevant to and satisfy all the requirements of the elements, performance criteria and range of conditions on at least two separate occasions and includes:

- applying Work, Health and Safety (WHS)/Occupational Health and Safety (OHS) including:
  - risk control measures
  - emergency procedures
  - safe working practices
- communicating with personnel
- identifying and responding to abnormal plant operating conditions
- implementing legislation, industry standards, codes of practice and regulations
- interpreting manufacturers' specifications and manuals
- monitoring and inspecting hydro generator synchronous condenser pump unit plant operations
- operating hydro generator synchronous condenser pump unit plant completing workplace documentation
- organising resources
- planning hydro generator synchronous condenser pump unit plant work
- recognising hydro turbine generator/pump unit plant status
- reporting on hydro generator pump unit plant status
- testing hydro turbine generator synchronous condenser pump unit plant operationally using diagnostic and data analysis techniques
- utilising measuring and testing instruments to identify faults and abnormalities

Knowledge Evidence

Evidence required to demonstrate competence in this unit must be relevant to and satisfy all the requirements of the elements, performance criteria and range of conditions and includes knowledge of:

- hydro turbine generator synchronous condenser pump unit plant and equipment, its location and operating parameters
- hydro turbine generator synchronous condenser pump unit plant operation

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- manufacturers' specifications and manuals
- typical arrangements of power production plant
- WHS/OHS legislated requirements including:
  - emergency procedures
  - risk control measures
  - safe working practices
- workplace documentation
- workplace policies and procedures

Assessment Conditions

As a minimum, assessors must satisfy applicable regulatory requirements, which include requirements in the Standards for Registered Training Organisations current at the time of assessment.

As a minimum, assessment must satisfy applicable regulatory requirements, which include requirements in the Standards for Registered Training Organisations current at the time of assessment.

Assessment processes and techniques must be appropriate to the language, literacy and numeracy requirements of the work being performed and the needs of the candidate.

Assessment must occur in workplace operational situations. Where this is not appropriate, assessment must occur in simulated workplace operational situations that reflect workplace conditions.

Resources for assessment must include access to:

- a range of relevant exercises, case studies and/or other simulations
- relevant and appropriate materials, tools, equipment and personal protective equipment currently used in industry
- applicable documentation including workplace procedures, industry standards, equipment specifications, regulations, codes of practice and operation manuals.

Links

Companion Volume implementation guides are found in VETNet - https://vetnet.gov.au/Pages/TrainingDocs.aspx?q=1715b9fa-e7bd-441c-bb8d-cf22c9c825a8

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UEPOPS336 Manage, operate and monitor a gas turbine unit

Modification History

Release 1. This is the first release of this unit of competency in the UEP Generation Training Package.

Application

This unit involves the skills and knowledge required to undertake the management of an in-service gas turbine unit.

A gas turbine is an internal combustion engine that converts natural gas or other liquid fuels to mechanical energy.

Competency in this unit requires the ability to plan work, operate gas turbine plant, test gas turbine plant, analyse gas turbine plant faults, monitor gas turbine plant and complete all documentation. Individuals will, in general, work as a frontline manager or supervisor, in a power generation facility.

Power generation plant operators are typically trained and authorised to isolate, prepare plant and issue permits to work.

No licensing, legislative or certification requirements apply to this unit at the time of publication.

Note: Workplace practice

The application of the skills and knowledge described in this unit may require a licence or training permit to practice in the workplace where work is carried out on gas and electrical installations. Additional conditions may apply under state and territory legislative and regulatory licensing requirements.

Pre-requisite Unit

There are no prerequisite units.

Competency Field

Operations

Unit Sector

Electricity generation

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Elements and Performance Criteria

ELEMENTS	PERFORMANCE CRITERIA
Elements describe the essential outcomes.	Performance criteria describe the performance needed to demonstrate achievement of the element.
1 Plan and prepare work	**1.1** Safety issues related to managing, operating and monitoring gas turbine plant are identified in accordance with workplace procedures and Work, Health and Safety (WHS)/Occupational Health and Safety (OHS) regulations and legislative requirements
	1.2 Work requirements are identified, in accordance with workplace procedures, from appropriate personnel and documentation
	1.3 Preoperational checks are carried out on gas turbine plant, in accordance with workplace procedures, manufacturer s' recommendations and site requirements
2 Operate gas turbine plant	**2.1** Output is adjusted to achieve required gas turbine operating conditions and demand, in accordance with workplace procedures
	2.2 Gas turbine plant is operated within limits of its' design, in accordance with workplace procedures
	2.3 Gas turbine plant is monitored and observed, in accordance with workplace procedures, to detect deviations from operating conditions
	2.4 Corrective actions are taken to rectify gas turbine plant abnormalities, in accordance with workplace procedures and manufacturers' recommendations
3 Test gas turbine plant operation	**3.1** Operational tests are performed, in accordance with workplace procedures
	3.2 Gas turbine plant is observed for correct operational response, in accordance with workplace procedures
	3.3 Corrective action is taken when response does not meet with documentation, gas turbine plant integrity or personnel safety requirements
	3.4 Gas turbine plant is returned to required operational status upon completion of testing, in accordance with workplace procedures

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4 Analyse gas turbine plant faults	**4.1**	Causes of abnormal gas turbine plant operating conditions are identified, in accordance with workplace procedures, and by analysing technical and operational information
	4.2	Corrective action is taken, in accordance with workplace procedures
	4.3	Gas turbine plant integrity and personnel safety is maintained, in accordance with workplace procedures, and in consultation with appropriate personnel and technical and operational documentation
	4.4	Appropriate personnel are notified, in accordance with workplace procedures, when defects are detected
5 Monitor gas turbine plant	**5.1**	Gas turbine plant to be monitored is identified, in accordance with workplace procedures
	5.2	Gas turbine plant is monitored, in accordance with workplace procedures, for normal operation or to detect deviations
	5.3	Appropriate personnel are notified, in accordance with workplace procedures, when defects are detected
6 Complete documentation	**6.1**	Gas turbine plant problems, movements, and status is reported, in accordance with workplace procedures
	6.2	Documentation is updated, in accordance with workplace procedures

Foundation Skills

Foundation skills essential to performance are explicit in the performance criteria of this unit of competency.

Range of Conditions

Range is restricted to essential operating conditions and any other variables essential to the work environment.

Non-essential conditions may be found in the Companion Volume Implementation Guide.

Unit Mapping Information

This unit replaces and is equivalent to UEPOPS336B Manage, operate and monitor a gas turbine

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unit.

Links

Companion Volume implementation guides are found in VETNet - https://vetnet.gov.au/Pages/TrainingDocs.aspx?q=1715b9fa-e7bd-441c-bb8d-cf22c9c825a8

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Assessment Requirements for UEPOPS336 Manage, operate and monitor a gas turbine unit

Modification History

Release 1. This is the first release of this unit of competency in the UEP Generation Training Package.

Performance Evidence

Evidence required to demonstrate competence in this unit must be relevant to and satisfy all the requirements of the elements, performance criteria and range of conditions on at least two separate occasions and includes:

- analysing gas turbine plant faults using data analysis techniques and tools
- applying Work, Health and Safety (WHS)/Occupational Health and Safety (OHS) requirements including:
  - emergency procedures
  - risk control measures
  - safe working practices
- communicating with personnel
- completing documentation
- identifying gas turbine plant status
- implementing legislation, industry standards, codes of practice and regulations
- interpreting manufacturers' specifications and manuals
- monitoring gas turbine plant operations
- organising resources
- planning work
- preparing and operating gas turbine plant and/or equipment
- recognising and responding to abnormal gas turbine plant operating conditions
- testing gas turbine plant operationally using diagnostic and test techniques
- working with permit to work system

Knowledge Evidence

Evidence required to demonstrate competence in this unit must be relevant to and satisfy all the requirements of the elements, performance criteria and range of conditions and includes knowledge of:

- gas turbine plant and equipment, its location and operating parameters gas turbine plant generator types and characteristics including:
  - system components and their interaction

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  - gas turbine operational processes
  - gas turbine plant status
- legislation, industry standards, codes of practice and regulations
- manufacturers' specifications and manuals
- permit to work system
- typical arrangements of power production
- WHS/OHS legislated requirements including:
  - emergency procedures
  - risk control measures
  - safe working practices
- workplace documentation
- workplace policies and procedures

Assessment Conditions

As a minimum, assessors must satisfy applicable regulatory requirements, which include requirements in the Standards for Registered Training Organisations current at the time of assessment.

As a minimum, assessment must satisfy applicable regulatory requirements, which include requirements in the Standards for Registered Training Organisations current at the time of assessment.

Assessment processes and techniques must be appropriate to the language, literacy and numeracy requirements of the work being performed and the needs of the candidate.

Assessment must occur in workplace operational situations. Where this is not appropriate, assessment must occur in simulated workplace operational situations that reflect workplace conditions.

Resources for assessment must include access to:

- a range of relevant exercises, case studies and/or other simulations
- relevant and appropriate materials, tools, equipment and personal protective equipment currently used in industry
- applicable documentation including workplace procedures, industry standards, equipment specifications, regulations, codes of practice and operation manuals.

Links

Companion Volume implementation guides are found in VETNet - https://vetnet.gov.au/Pages/TrainingDocs.aspx?q=1715b9fa-e7bd-441c-bb8d-cf22c9c825a8

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UEPOPS337 Maintain quality systems within the team

Modification History

Release 1. This is the first release of this unit of competency in the UEP Generation Training Package.

Application

This unit involves the skills and knowledge required to oversee compliance of the maintenance quality system, using performance indicators, within a team environment.

Quality control is a process through which an organisation seeks to ensure that significant variations in quality are kept to a minimum. Quality control in power generation facilities will focus on a set of procedures intended to ensure that personnel, plant and equipment operate efficiently.

Competency in this unit requires the ability to formulate team aspects of the quality system and facilitate team quality systems. Individuals will, in general, work as an operator, in a power generation facility.

No licensing, legislative or certification requirements apply to this unit at the time of publication.

Note: Workplace practice

The application of the skills and knowledge described in this unit may require a licence or training permit to practice in the workplace where work is carried out on gas and electrical installations. Additional conditions may apply under state and territory legislative and regulatory licensing requirements.

Pre-requisite Unit

UEPOPS202 Apply quality systems to work

Competency Field

Operations

Unit Sector

Electricity generation

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Elements and Performance Criteria

ELEMENTS	PERFORMANCE CRITERIA
Elements describe the essential outcomes.	Performance criteria describe the performance needed to demonstrate achievement of the element.
1 Formulate team aspects of the quality system	**1.1** Quality assurance requirements for team are identified or modified from an analysis of workplace needs, in accordance with workplace procedures
	1.2 Team performance indicators, are referred to appropriate personnel for approval in accordance with workplace procedures
	1.3 Quality system documentation is obtained, and modified, in accordance with workplace procedures and quality assurance standards
2 Facilitate team quality systems	**2.1** Team discussion on quality system is undertaken, in accordance with workplace procedures
	2.2 Quality system is monitored, in accordance with workplace procedures and quality assurance standards
	2.3 Failure to satisfy Key Performance Indicators (KPIs) is recorded and investigated, in accordance with workplace procedures and quality assurance standards
	2.4 Quality system is reviewed with the team to ensure currency and relevance, in accordance with workplace procedures and quality assurance standards
	2.5 Quality system records for the team are maintained, in accordance with workplace procedures and quality assurance standards

Foundation Skills

Foundation skills essential to performance are explicit in the performance criteria of this unit of competency.

Range of Conditions

Range is restricted to essential operating conditions and any other variables essential to the work environment.

Non-essential conditions may be found in the Companion Volume Implementation Guide.

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Unit Mapping Information

This unit replaces and is equivalent to UEPOPS337B Maintain quality systems within the team.

Links

Companion Volume implementation guides are found in VETNet - https://vetnet.gov.au/Pages/TrainingDocs.aspx?q=1715b9fa-e7bd-441c-bb8d-cf22c9c825a8

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Assessment Requirements for UEPOPS337 Maintain quality systems within the team

Modification History

Release 1. This is the first release of this unit of competency in the UEP Generation Training Package.

Performance Evidence

Evidence required to demonstrate competence in this unit must be relevant to and satisfy all the requirements of the elements, performance criteria and range of conditions on at least two separate occasions and includes:

- applying Work, Health and Safety (WHS)/Occupational Health and Safety (OHS) regulations including:
  - emergency procedures
  - risk control measures
  - safe working practices
- communicating with personnel
- implementing legislation, industry standards, codes of practice and regulations
- maintaining records and documentation
- monitoring and reviewing quality system
- recommending and implementing workplace quality improvements
- undertaking performance reporting including Key Performance Indicators (KPIs) and key result areas
- using continuous improvement and quality management tools and techniques
- working with quality standards

Knowledge Evidence

Evidence required to demonstrate competence in this unit must be relevant to and satisfy all the requirements of the elements, performance criteria and range of conditions and includes knowledge of:

- industry quality standards
- legislation, industry standards, codes of practice and regulations
- Quality Management System (QMS) tools and continuous improvement techniques including key result areas and key performance indicators
- records and documentation
- WHS/OHS legislated requirements including:
  - emergency procedures
  - safe working practices

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- risk control measures

Assessment Conditions

As a minimum, assessors must satisfy applicable regulatory requirements, which include requirements in the Standards for Registered Training Organisations current at the time of assessment.

As a minimum, assessment must satisfy applicable regulatory requirements, which include requirements in the Standards for Registered Training Organisations current at the time of assessment.

Assessment processes and techniques must be appropriate to the language, literacy and numeracy requirements of the work being performed and the needs of the candidate.

Assessment must occur in workplace operational situations. Where this is not appropriate, assessment must occur in simulated workplace operational situations that reflect workplace conditions.

Resources for assessment must include access to:

- a range of relevant exercises, case studies and/or other simulations
- relevant and appropriate materials, tools, equipment and personal protective equipment currently used in industry
- applicable documentation including workplace procedures, industry standards, equipment specifications, regulations, codes of practice and operation manuals.

Links

Companion Volume implementation guides are found in VETNet - https://vetnet.gov.au/Pages/TrainingDocs.aspx?q=1715b9fa-e7bd-441c-bb8d-cf22c9c825a8

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UEPOPS338 Facilitate workplace communication

Modification History

Release 1. This is the first release of this unit of competency in the UEP Generation Training Package.

Application

This unit involves the skills and knowledge required to facilitate workplace communication.

Workplace communication is the process of exchanging information, both verbal and non-verbal, within a team or unit.

Competency in this unit requires the ability to plan and prepare for communication, facilitate team communications and determine team views. Individuals will, in general, work as a coordinator, in a power generation facility.

No licensing, legislative or certification requirements apply to this unit at the time of publication.

Note: Workplace practice

The application of the skills and knowledge described in this unit may require a licence or training permit to practice in the workplace where work is carried out on gas and electrical installations. Additional conditions may apply under state and territory legislative and regulatory licensing requirements.

Pre-requisite Unit

There are no prerequisite units.

Competency Field

Operations

Unit Sector

Electricity generation

Elements and Performance Criteria

ELEMENTS	PERFORMANCE CRITERIA
Elements describe the essential outcomes.	Performance criteria describe the performance needed to demonstrate achievement of the element.

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1 Plan and prepare for communication	**1.1** Communication requirements are identified
	1.2 Workplace communication system is established
	1.3 Workplace communication system is monitored and modified, in accordance with workplace procedures
2 Facilitate team communications	**2.1** Workplace briefings and meetings are scheduled and facilitated, in accordance with workplace procedures
	2.2 Written and verbal reports are presented clearly, concisely and logically
3 Determine team views	**3.1** Team consensus is achieved
	3.2 Agendas and minutes are used, in accordance with workplace procedures, to convey team decisions to appropriate personnel

Foundation Skills

Foundation skills essential to performance are explicit in the performance criteria of this unit of competency.

Range of Conditions

Range is restricted to essential operating conditions and any other variables essential to the work environment.

Non-essential conditions may be found in the Companion Volume Implementation Guide.

Unit Mapping Information

This unit replaces and is equivalent to UEPOPS338B Facilitate effective workplace communication.

Links

Companion Volume implementation guides are found in VETNet - https://vetnet.gov.au/Pages/TrainingDocs.aspx?q=1715b9fa-e7bd-441c-bb8d-cf22c9c825a8

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Assessment Requirements for UEPOPS338 Facilitate workplace communication

Modification History

Release 1. This is the first release of this unit of competency in the UEP Generation Training Package.

Performance Evidence

Evidence required to demonstrate competence in this unit must be relevant to and satisfy all the requirements of the elements, performance criteria and range of conditions on at least two separate occasions and includes:

- applying Work, Health and Safety (WHS)/Occupational Health and Safety (OHS) requirements
- communicating with team members using approved methods and techniques
- facilitating team communications determining team views
- planning and preparing for team communications
- using workplace communication procedures
- working with meeting agendas and minutes

Knowledge Evidence

Evidence required to demonstrate competence in this unit must be relevant to and satisfy all the requirements of the elements, performance criteria and range of conditions and includes knowledge of:

- meeting agendas and minutes WHS/OHS legislated requirements workplace documentation
- plan and prepare for workplace communication including:
  - communication equipment
  - document writing
  - facilitation of team meetings
- workplace policies and procedures

Assessment Conditions

As a minimum, assessors must satisfy applicable regulatory requirements, which include requirements in the Standards for Registered Training Organisations current at the time of assessment.

As a minimum, assessment must satisfy applicable regulatory requirements, which include requirements in the Standards for Registered Training Organisations current at the time of

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assessment.

Assessment processes and techniques must be appropriate to the language, literacy and numeracy requirements of the work being performed and the needs of the candidate.

Assessment must occur in workplace operational situations. Where this is not appropriate, assessment must occur in simulated workplace operational situations that reflect workplace conditions.

Resources for assessment must include access to:

- a range of relevant exercises, case studies and/or other simulations
- relevant and appropriate materials, tools, equipment and personal protective equipment currently used in industry
- applicable documentation including workplace procedures, industry standards, equipment specifications, regulations, codes of practice and operation manuals.

Links

Companion Volume implementation guides are found in VETNet - https://vetnet.gov.au/Pages/TrainingDocs.aspx?q=1715b9fa-e7bd-441c-bb8d-cf22c9c825a8

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UEPOPS339 Operate and monitor a boiler unit

Modification History

Release 1. This is the first release of this unit of competency in the UEP Generation Training Package.

Application

This unit involves the skills and knowledge required to operate and monitor an in-service boiler unit capable of supplying steam.

Boilers are used to create steam by applying heat to water, the steam expands and turns the turbines and these in turn drive the generators in power generation facilities.

Competency in this unit requires the ability to plan work, operate boiler unit plant, test boiler unit plant, analyse boiler unit plant faults, monitor and inspect boiler unit and complete all documentation. Individuals will, in general, work under supervision, in a power generation facility as an operator.

Power generation plant operators are typically trained and authorised to isolate, prepare plant and issue permits to work.

No licensing, legislative or certification requirements apply to this unit at the time of publication.

Note: Workplace practice

The application of the skills and knowledge described in this unit may require a licence or training permit to practice in the workplace where work is carried out on gas and electrical installations. Additional conditions may apply under state and territory legislative and regulatory licensing requirements.

Pre-requisite Unit

There are no prerequisite units.

Competency Field

Operations

Unit Sector

Electricity generation

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Elements and Performance Criteria

ELEMENTS	PERFORMANCE CRITERIA
Elements describe the essential outcomes.	Performance criteria describe the performance needed to demonstrate achievement of the element.
1 Plan and prepare work	**1.1** Safety issues related to operating and monitoring boiler unit plant are identified, in accordance with workplace procedures and Work, Health and Safety (WHS)/Occupational Health and Safety (OHS) regulations and legislative requirements
	1.2 Work requirements are identified, in accordance with workplace procedures, from relevant personnel and documentation
	1.3 Preoperational checks are carried out on boiler unit plant, in accordance with workplace procedures, manufacturers' recommendations and site requirements
2 Operate boiler unit plant	**2.1** Combustion is established and fuel consumption at minimum levels is supported, in accordance with workplace procedures, manufacturers' recommendations and site requirements
	2.2 Fuel and air feed flows are adjusted to achieve required steam conditions and demand, in accordance with workplace procedures, and observation of operating requirements
	2.3 Boiler unit plant is operated within the limits of its' design, in accordance with workplace procedures and site requirements
	2.4 Boiler unit plant is monitored and observed, in accordance with workplace procedures, to detect deviations from required operating conditions
	2.5 Corrective actions are taken to rectify boiler unit abnormalities, in accordance with workplace procedures and manufacturers' recommendations
3 Test boiler unit plant operation	**3.1** Operational tests are performed, in accordance with workplace procedures
	3.2 Boiler unit plant is observed for correct operational response, in accordance with workplace procedures

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	3.3	Corrective action is taken, in accordance with workplace procedures, when response does not meet with documentation, boiler unit plant integrity or personnel safety requirements
	3.4	Boiler unit plant is returned to required operational status upon completion of test, in accordance with workplace procedures
4 Analyse boiler unit plant faults	**4.1**	Causes of abnormal boiler unit plant operating conditions are identified, in accordance with workplace procedures, and by analysing technical and operational information
	4.2	Corrective action is taken, in accordance with workplace procedures
	4.3	Boiler unit plant integrity and personnel safety is maintained, in accordance with workplace procedures, and in consultation with appropriate personnel and technical and operational documentation
	4.4	Appropriate personnel are notified when defects are detected, in accordance with workplace procedures
5 Monitor boiler unit plant	**5.1**	Boiler unit plant to be monitored is identified, in accordance with workplace procedures
	5.2	Boiler unit plant is monitored for normal operation or to detect deviations, in accordance with workplace procedures
	5.3	Appropriate personnel are notified when defects are detected, in accordance with workplace procedures
6 Complete documentation	**6.1**	Boiler unit plant problems, movements, abnormalities and status is reported, in accordance with workplace procedures
	6.2	Documentation is updated, in accordance with workplace procedures

Foundation Skills

Foundation skills essential to performance are explicit in the performance criteria of this unit of competency.

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Range of Conditions

Range is restricted to essential operating conditions and any other variables essential to the work environment.

Non-essential conditions may be found in the Companion Volume Implementation Guide.

Unit Mapping Information

This unit replaces and is equivalent to UEPOPS339B Operate and monitor a boiler unit.

Links

Companion Volume implementation guides are found in VETNet - https://vetnet.gov.au/Pages/TrainingDocs.aspx?q=1715b9fa-e7bd-441c-bb8d-cf22c9c825a8

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Assessment Requirements for UEPOPS339 Operate and monitor a boiler unit

Modification History

Release 1. This is the first release of this unit of competency in the UEP Generation Training Package.

Performance Evidence

Evidence required to demonstrate competence in this unit must be relevant to and satisfy all the requirements of the elements, performance criteria and range of conditions on at least two separate occasions and includes:

- analysing boiler unit plant faults using data analysis techniques and tools
- applying Work, Health and Safety (WHS)/Occupational Health and Safety (OHS) requirements including:
  - emergency procedures
  - risk control measures
  - safe working practices
- communicating with personnel
- completing documentation using recording procedures
- identifying boiler unit plant status
- interpreting manufacturers' specifications and manuals
- operating boiler plant and equipment
- organising resources
- preparing and planning work
- recognising and responding to abnormal boiler unit plant operating conditions
- testing boiler unit plant operationally using diagnostic and test techniques
- utilising permit to work system
- working with boiler unit plant and/or equipment

Knowledge Evidence

Evidence required to demonstrate competence in this unit must be relevant to and satisfy all the requirements of the elements, performance criteria and range of conditions and includes knowledge of:

- boiler unit plant and equipment, its location and operating parameters
- boiler unit plant operation processes
- boiler unit plant status
- legislation, industry standards, codes of practice and regulations

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- manufacturers' specifications and manuals
- permit to work system
- typical arrangements of power production plant
- WHS/OHS legislated requirements including:
  - emergency procedures
  - risk control measures
  - safe working practices
- workplace documentation
- workplace policies and procedures

Assessment Conditions

As a minimum, assessors must satisfy applicable regulatory requirements, which include requirements in the Standards for Registered Training Organisations current at the time of assessment.

As a minimum, assessment must satisfy applicable regulatory requirements, which include requirements in the Standards for Registered Training Organisations current at the time of assessment.

Assessment processes and techniques must be appropriate to the language, literacy and numeracy requirements of the work being performed and the needs of the candidate.

Assessment must occur in workplace operational situations. Where this is not appropriate, assessment must occur in simulated workplace operational situations that reflect workplace conditions.

Resources for assessment must include access to:

- a range of relevant exercises, case studies and/or other simulations
- relevant and appropriate materials, tools, equipment and personal protective equipment currently used in industry
- applicable documentation including workplace procedures, industry standards, equipment specifications, regulations, codes of practice and operation manuals.

Links

Companion Volume implementation guides are found in VETNet - https://vetnet.gov.au/Pages/TrainingDocs.aspx?q=1715b9fa-e7bd-441c-bb8d-cf22c9c825a8

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UEPOPS340 Operate and monitor a steam turbine

Modification History

Release 1. This is the first release of this unit of competency in the UEP Generation Training Package.

Application

This unit involves the skills and knowledge required to operate and monitor an in-service steam turbine.

A steam turbine extracts thermal energy from pressurised steam and is particularly suited to driving an electrical generator as the high pressure steam is used to turn electricity generators at elevated speed.

Competency in this unit requires the ability to plan work, operate steam turbine plant, test steam turbine plant, analyse steam turbine plant faults, monitor and inspect steam turbine and the completion of all documentation. Individuals will, in general, work under supervision, in a power generation facility as an operator.

Power generation plant operators are typically trained and authorised to isolate, prepare plant and issue permits to work.

No licensing, legislative or certification requirements apply to this unit at the time of publication.

Note: Workplace practice

The application of the skills and knowledge described in this unit may require a licence or training permit to practice in the workplace where work is carried out on gas and electrical installations. Additional conditions may apply under state and territory legislative and regulatory licensing requirements.

Pre-requisite Unit

There are no prerequisite units.

Competency Field

Operations

Unit Sector

Electricity generation

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Elements and Performance Criteria

ELEMENTS	PERFORMANCE CRITERIA
Elements describe the essential outcomes.	Performance criteria describe the performance needed to demonstrate achievement of the element.
1 Plan and prepare work	**1.1** Safety issues related to operating and monitoring steam turbine plant are identified, in accordance with workplace procedures and Work, Health and Safety (WHS)/Occupational Health and Safety (OHS) regulations and legislative requirements
	1.2 Work requirements are identified, in accordance with workplace procedures, from appropriate personnel and documentation
	1.3 Preoperational checks are carried out on steam turbine plant, in accordance with workplace procedures, manufacturers' recommendations and site requirements
2 Operate steam turbine plant	**2.1** Steam turbine output is adjusted to meet demand, in accordance with workplace procedures
	2.2 Steam turbine plant is operated, in accordance with workplace procedures and manufacturers' operating recommendation
	2.3 Steam turbine plant is monitored and observed, in accordance with workplace procedures, to detect deviations from normal operating conditions
	2.4 Corrective actions are taken to rectify steam turbine plant abnormalities, in accordance with workplace procedures and manufacturers' recommendations
3 Test steam turbine plant operation	**3.1** Operational tests are performed, in accordance with workplace procedures
	3.2 Steam turbine plant is observed for correct operational response, in accordance with workplace procedures
	3.3 Corrective action is taken, in accordance with workplace procedures, when response does not meet with documentation, steam turbine plant integrity or personnel safety requirements
	3.4 Steam turbine plant is returned to required operational status upon completion of test, in accordance with

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		workplace procedures
4	**Analyse steam turbine faults**	**4.1** Causes of abnormal steam turbine plant operating conditions are identified, in accordance with workplace procedures, and by analysing technical and operational information
		4.2 Corrective action is taken, in accordance with workplace procedures
		4.3 Steam turbine plant integrity and personnel safety is maintained, in accordance with workplace procedures, and in consultation with appropriate personnel and technical and operational documentation
		4.4 Appropriate personnel are notified when defects are detected, in accordance with workplace procedures
5	**Monitor steam turbine plant**	**5.1** Steam turbine plant to be monitored is identified, in accordance with workplace procedures
		5.2 Steam turbine plant is monitored for normal operation or to detect deviations, in accordance with workplace procedures
		5.3 Appropriate personnel are notified when defects are detected, in accordance with workplace procedures
6	**Complete documentation**	**6.1** Steam turbine plant problems, movements and status is reported, in accordance with workplace procedures
		6.2 Documentation is updated, in accordance with workplace procedures

Foundation Skills

Foundation skills essential to performance are explicit in the performance criteria of this unit of competency.

Range of Conditions

Range is restricted to essential operating conditions and any other variables essential to the work environment.

Non-essential conditions may be found in the Companion Volume Implementation Guide.

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Unit Mapping Information

This unit replaces and is equivalent to UEPOPS340B Operate and monitor a steam turbine.

Links

Companion Volume implementation guides are found in VETNet - https://vetnet.gov.au/Pages/TrainingDocs.aspx?q=1715b9fa-e7bd-441c-bb8d-cf22c9c825a8

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Assessment Requirements for UEPOPS340 Operate and monitor a steam turbine

Modification History

Release 1. This is the first release of this unit of competency in the UEP Generation Training Package.

Performance Evidence

Evidence required to demonstrate competence in this unit must be relevant to and satisfy all the requirements of the elements, performance criteria and range of conditions on at least two separate occasions and includes:

- analysing steam turbine plant faults using data analysis techniques and tools
- applying Work, Health and Safety (WHS)/Occupational Health and Safety (OHS) requirements including:
  - emergency procedures
  - risk control measures
  - safe working practices
- communicating with personnel
- completing documentation using recording procedures
- identifying steam turbine plant status
- implementing legislation, industry standards, codes of practice and regulations
- interpreting manufacturers' specifications and manuals
- monitoring and inspecting steam turbine plant operation
- operating steam turbine plant and equipment
- organising resources
- preparing and planning work
- recognising and responding to abnormal steam turbine plant operating conditions
- testing steam turbine plant operationally using diagnostic and test techniques
- utilising permit to work system
- working with steam turbine plant and equipment

Knowledge Evidence

Evidence required to demonstrate competence in this unit must be relevant to and satisfy all the requirements of the elements, performance criteria and range of conditions and includes knowledge of:

- legislation, industry standards, codes of practice and regulations
- manufacturers' specifications and manuals

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- permit to work system
- steam turbine plant and equipment, its location and operating parameters
- steam turbine plant status
- typical arrangements of power production plant
- steam turbine operational processes
- WHS/OHS legislated requirements including:
  - emergency procedures
  - risk control measures
  - safe working practices
- workplace documentation
- workplace policies and procedures

Assessment Conditions

As a minimum, assessors must satisfy applicable regulatory requirements, which include requirements in the Standards for Registered Training Organisations current at the time of assessment.

As a minimum, assessment must satisfy applicable regulatory requirements, which include requirements in the Standards for Registered Training Organisations current at the time of assessment.

Assessment processes and techniques must be appropriate to the language, literacy and numeracy requirements of the work being performed and the needs of the candidate.

Assessment must occur in workplace operational situations. Where this is not appropriate, assessment must occur in simulated workplace operational situations that reflect workplace conditions.

Resources for assessment must include access to:

- a range of relevant exercises, case studies and/or other simulations
- relevant and appropriate materials, tools, equipment and personal protective equipment currently used in industry
- applicable documentation including workplace procedures, industry standards, equipment specifications, regulations, codes of practice and operation manuals.

Links

Companion Volume implementation guides are found in VETNet - https://vetnet.gov.au/Pages/TrainingDocs.aspx?q=1715b9fa-e7bd-441c-bb8d-cf22c9c825a8

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UEPOPS342 Analyse single protection device operation

Modification History

Release 1. This is the first release of this unit of competency in the UEP Generation Training Package.

Application

This unit involves the skills and knowledge required to analyse the operation of single protection devices.

Protection devices aim to keep power generation systems stable by isolating the components that are faulty, whilst leaving as much of the network as possible still in operation. Single operation protection devices are designed for specific types of apparatus used in power generation facilities.

Competency in this unit requires the ability to respond to single protection device operation, interpret and determine cause of single protection device operation, restore single protection device operation and complete documentation. Individuals will, in general, work under supervision, in a power generation facility as an operator. Power generation plant operators are typically trained and authorised to isolate, prepare plant and issue permits to work.

No licensing, legislative or certification requirements apply to this unit at the time of publication.

Note: Workplace practice

The application of the skills and knowledge described in this unit may require a licence or training permit to practice in the workplace where work is carried out on gas and electrical installations. Additional conditions may apply under state and territory legislative and regulatory licensing requirements.

Pre-requisite Unit

There are no prerequisite units.

Competency Field

Operations

Unit Sector

Electricity generation

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Elements and Performance Criteria

ELEMENTS	PERFORMANCE CRITERIA
Elements describe the essential outcomes.	Performance criteria describe the performance needed to demonstrate achievement of the element.
1 Respond to protection operation	**1.1** Electrical and mechanical single protection device operations are confirmed, in accordance with workplace procedures
	1.2 Apparatus affected by single protection device operations are identified, in accordance with workplace procedures
	1.3 Single protection device targets, flags and alarms are identified, and recorded, in accordance with workplace procedures
	1.4 Relevant stakeholders are advised, in accordance with workplace procedures
2 Interpret and determine cause of protection operation	**2.1** Communication with external stakeholders, and internal personnel, is undertaken and is recorded, in accordance with workplace procedures
	2.2 Information on single protection device operations is collated and assessed, in accordance with workplace procedures
	2.3 Sequence of events prior to, and following, single protection device operation is identified and analysed, in accordance with workplace procedures
	2.4 Single protection device operations are analysed and evaluated, in accordance with workplace procedures
	2.5 Single protection device operation findings are analysed, in conjunction with recorded data, to determine most probable cause of fault, in accordance with workplace procedures
3 Restore protection	**3.1** Relevant stakeholders are informed of single protection device operation findings and plan of action, in accordance with workplace procedures
	3.2 Single protection device indicators are reset, in accordance with workplace procedures

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	3.3	Corrective action is taken, in accordance with fault type and workplace procedures
4 Complete documentation	**4.1**	All single protection device operations events are analysed and reported to approved personnel, in accordance with workplace procedures
	4.2	Records are updated, in accordance with workplace procedures

Foundation Skills

Foundation skills essential to performance are explicit in the performance criteria of this unit of competency.

Range of Conditions

Range is restricted to essential operating conditions and any other variables essential to the work environment.

Non-essential conditions may be found in the Companion Volume Implementation Guide.

Unit Mapping Information

This unit replaces and is equivalent to UEPOPS342B Interpret and analyse single operation protection devices.

Links

Companion Volume implementation guides are found in VETNet - https://vetnet.gov.au/Pages/TrainingDocs.aspx?q=1715b9fa-e7bd-441c-bb8d-cf22c9c825a8

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Assessment Requirements for UEPOPS342 Analyse single protection device operation

Modification History

Release 1. This is the first release of this unit of competency in the UEP Generation Training Package.

Performance Evidence

Evidence required to demonstrate competence in this unit must be relevant to and satisfy all the requirements of the elements, performance criteria and range of conditions on at least two separate occasions and includes:

- applying Work, Health and Safety (WHS)/Occupational Health and Safety (OHS) requirements including:
  - emergency procedures
  - risk control measures
  - safe working practices
- communicating with stakeholders
- communicating with stakeholders
- completing documentation
- implementing legislation, industry standards, codes of practice and regulations
- interpreting and analysing cause of electrical and mechanical single protection devices operation
- interpreting and determining cause of single protection device operations
- responding to electrical and mechanical single protection device operations
- responding to single protection device operations
- restoring electrical and mechanical single protection device status
- restoring single protection devices
- using manufacturers' specifications and manuals

Knowledge Evidence

Evidence required to demonstrate competence in this unit must be relevant to and satisfy all the requirements of the elements, performance criteria and range of conditions and includes knowledge of:

- alarms and flags raised by single protection devices
- causes of single protection devices operation
- fault finding methods and tools
- legislation, industry standards, codes of practice and regulations
- manufacturers' specifications and manuals

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- resetting or restoring electrical and mechanical protection
- single protection devices
- single protection systems and schemes including electrical and mechanical protection
- stakeholder communication
- types of electrical and mechanical faults
- WHS/OHS legislated requirements including:
  - emergency procedures
  - risk control measures
  - safe working practices
- workplace documentation
- workplace policies and procedures

Assessment Conditions

As a minimum, assessors must satisfy applicable regulatory requirements, which include requirements in the Standards for Registered Training Organisations current at the time of assessment.

As a minimum, assessment must satisfy applicable regulatory requirements, which include requirements in the Standards for Registered Training Organisations current at the time of assessment.

Assessment processes and techniques must be appropriate to the language, literacy and numeracy requirements of the work being performed and the needs of the candidate.

Assessment must occur in workplace operational situations. Where this is not appropriate, assessment must occur in simulated workplace operational situations that reflect workplace conditions.

Resources for assessment must include access to:

- a range of relevant exercises, case studies and/or other simulations
- relevant and appropriate materials, tools, equipment and personal protective equipment currently used in industry
- applicable documentation including workplace procedures, industry standards, equipment specifications, regulations, codes of practice and operation manuals.

Links

Companion Volume implementation guides are found in VETNet - https://vetnet.gov.au/Pages/TrainingDocs.aspx?q=1715b9fa-e7bd-441c-bb8d-cf22c9c825a8

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UEPOPS343 Operate hydroelectric generating plant and auxiliary equipment

Modification History

Release 1. This is the first release of this unit of competency in the UEP Generation Training Package.

Application

This unit involves the skills and knowledge required to operate a hydroelectric power generating facility. It includes the operational and maintenance activities associated with hydroelectric operating plant and auxiliary equipment.

Auxiliary plant systems and related controls are used to support the operation of hydro generating facilities. Auxiliary plant systems typically include ancillary equipment such as pumps, valves, seals and screens, motors, waterwheels and generators.

Competency in this unit requires the ability to plan and prepare work, operate, test, analyse and report on hydroelectric generating plant and auxiliary equipment. Individuals will, in general, work under supervision, in a power generation facility as an operator.

Power generation plant operators are typically trained and authorised to isolate, prepare plant and issue permits to work.

No licensing, legislative or certification requirements apply to this unit at the time of publication.

Note: Workplace practice

The application of the skills and knowledge described in this unit may require a licence or training permit to practice in the workplace where work is carried out on gas and electrical installations. Additional conditions may apply under state and territory legislative and regulatory licensing requirements.

Pre-requisite Unit

There are no prerequisite units.

Competency Field

Operations

Unit Sector

Electricity generation

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Elements and Performance Criteria

ELEMENTS	PERFORMANCE CRITERIA
Elements describe the essential outcomes.	Performance criteria describe the performance needed to demonstrate achievement of the element.
1 Plan and prepare work	**1.1** Work, Health and Safety(WHS)/Occupational Health and Safety (OHS) regulations, legislative requirements, industry standards, codes of practice, manufacturers' specifications, environmental obligations and workplace procedures are applied and monitored
	1.2 Work, hydroelectric generating plant and type of start requirements are identified from appropriate personnel and documentation, in accordance with workplace procedures
	1.3 Turbine running-up and loading schedules are ascertained from relevant documentation, in accordance with workplace procedures and site requirements
	1.4 Hydroelectric generating plant and auxiliary equipment inspections, preoperational tests and field preparation for service are carried out, in accordance with manufacturers' recommendations and workplace procedures
	1.5 Hydroelectric generating plant and auxiliary equipment operational prerequisites are established, in accordance with manufacturers' recommendations and workplace procedures
	1.6 Sequence for recommissioning hydroelectric generating plant and auxiliary equipment is determined, in accordance with workplace procedures and site requirements
	1.7 Work is sequenced and prioritised, in accordance with workplace procedures and site requirements
2 Operate and monitor hydroelectric generating plant	**2.1** Hydroelectric generating plant is operated, in accordance with workplace procedures and manufacturers' recommendations
	2.2 Key indicator limits are maintained, in accordance with manufacturers' specifications and workplace procedures and site requirements

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	2.3	Auxiliary equipment is operated, in accordance with workplace procedures and manufacturers' recommendations
	2.4	Hydroelectric generating plant and auxiliary equipment is monitored, in accordance with workplace procedures, to detect deviations from normal operating conditions
	2.5	Hydroelectric generating plant and auxiliary equipment is operated, in accordance with workplace procedures and legislative requirements to gain maximum efficiency of energy conversion and to meet active and reactive despatch power outputs
	2.6	Corrective actions are taken to rectify any abnormalities, in accordance with manufacturers' recommendations and workplace procedures
3 Test hydroelectric generating plant and auxiliary equipment	**3.1**	Tests on hydroelectric generating plant and equipment are performed, in accordance with workplace procedures
	3.2	Hydroelectric generating plant and equipment is observed for correct operational response, in accordance with workplace procedures
	3.3	Hydroelectric generating plant and equipment is returned to required operational status on completion of testing, in accordance with workplace procedures
4 Analyse hydroelectric generating plant and auxiliary equipment faults	**4.1**	Causes of abnormal operating conditions are identified by analysing technical and operational information, in accordance with workplace procedures
	4.2	Hydroelectric generating plant integrity and personnel safety is maintained, in accordance workplace procedures and through consultation with appropriate personnel, technical and operational documentation
	4.3	Appropriate personnel are notified, in accordance with workplace procedures, when defects are detected
5 Complete documentation	**5.1**	Equipment problems, movements and status are reported, in accordance with workplace procedures
	5.2	Documentation is updated, in accordance with workplace procedures

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Foundation Skills

Foundation skills essential to performance are explicit in the performance criteria of this unit of competency.

Range of Conditions

Range is restricted to essential operating conditions and any other variables essential to the work environment.

Non-essential conditions may be found in the Companion Volume Implementation Guide.

Unit Mapping Information

This unit replaces and is equivalent to UEPOPS343B Operate hydro-electric generating plant and auxiliary equipment.

Links

Companion Volume implementation guides are found in VETNet - https://vetnet.gov.au/Pages/TrainingDocs.aspx?q=1715b9fa-e7bd-441c-bb8d-cf22c9c825a8

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Assessment Requirements for UEPOPS343 Operate hydroelectric generating plant and auxiliary equipment

Modification History

Release 1. This is the first release of this unit of competency in the UEP Generation Training Package.

Performance Evidence

Evidence required to demonstrate competence in this unit must be relevant to and satisfy all the requirements of the elements, performance criteria and range of conditions on at least two separate occasions and includes:

- applying Work, Health and Safety (WHS)/Occupational Health and Safety (OHS) legislated requirements including:
  - emergency procedures
  - risk control measures
  - safe working practices
- communicating with personnel
- completing workplace documentation
- implementing legislation, industry standards, codes of practice and regulations
- inspecting and monitoring hydroelectric generating plant and auxiliary equipment
- interpreting manufacturers' specifications and manuals
- operating hydroelectric generating plant and auxiliary equipment
- organising resources
- planning hydroelectric generating plant and auxiliary equipment work
- recognising and responding to abnormal hydroelectric generating plant and auxiliary equipment operating conditions using diagnostic and data analysis techniques
- reporting on hydroelectric generating plant and auxiliary equipment status
- testing hydroelectric generating plant and auxiliary equipment operationally using testing and measurement instruments to identify faults and abnormalities
- working with permit to work system

Knowledge Evidence

Evidence required to demonstrate competence in this unit must be relevant to and satisfy all the requirements of the elements, performance criteria and range of conditions and include knowledge of:

- hydroelectric generating plant and auxiliary equipment, its location and operating parameters
- manufacturers' specifications and manuals
- permit to work system

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- typical arrangements of power generation plant
- WHS/OHS legislated requirements including:
  - emergency procedures
  - risk control measures
  - safe working practices
- workplace policies and procedures
- workplace documentation hydroelectric generating plant and auxiliary equipment operation and status

Assessment Conditions

As a minimum, assessors must satisfy applicable regulatory requirements, which include requirements in the Standards for Registered Training Organisations current at the time of assessment.

As a minimum, assessment must satisfy applicable regulatory requirements, which include requirements in the Standards for Registered Training Organisations current at the time of assessment.

Assessment processes and techniques must be appropriate to the language, literacy and numeracy requirements of the work being performed and the needs of the candidate.

Assessment must occur in workplace operational situations. Where this is not appropriate, assessment must occur in simulated workplace operational situations that reflect workplace conditions.

Resources for assessment must include access to:

- a range of relevant exercises, case studies and/or other simulations
- relevant and appropriate materials, tools, equipment and personal protective equipment currently used in industry
- applicable documentation including workplace procedures, industry standards, equipment specifications, regulations, codes of practice and operation manuals.

Links

Companion Volume implementation guides are found in VETNet - https://vetnet.gov.au/Pages/TrainingDocs.aspx?q=1715b9fa-e7bd-441c-bb8d-cf22c9c825a8

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UEPOPS344 Conduct water conveyance and control

Modification History

Release 1. This is the first release of this unit of competency in the UEP Generation Training Package.

Application

This unit involves the skills and knowledge required for the operation of storage, conveyance and control systems of hydro generation water supplies.

Water storage, conveyance and control systems can include dams, canals, pipelines, tunnels and related hydraulic components and structures.

Competency in this unit requires the ability to plan work, supply water for power generation, implement flood control procedures and complete all documentation. Individuals will, in general, work as an operator in a power generation facility.

Power generation plant operators are typically trained and authorised to isolate, prepare plant and issue permits to work.

No licensing, legislative or certification requirements apply to this unit at the time of publication.

Note: Workplace practice

The application of the skills and knowledge described in this unit may require a licence or training permit to practice in the workplace where work is carried out on gas and electrical installations. Additional conditions may apply under state and territory legislative and regulatory licensing requirements.

Pre-requisite Unit

There are no prerequisite units.

Competency Field

Operations

Unit Sector

Electricity generation

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Elements and Performance Criteria

ELEMENTS	PERFORMANCE CRITERIA
Elements describe the essential outcomes.	Performance criteria describe the performance needed to demonstrate achievement of the element.
1 Plan and prepare	**1.1** Work, Health and Safety (WHS)/Occupational Health and Safety (OHS) regulations, legislative requirements, industry standards, codes of practice, manufacturers' specifications, environmental obligations and workplace procedures are identified, applied and monitored
	1.2 Work requirements for storage, conveyance and control systems of hydro generation water supplies are identified and confirmed with appropriate personnel or by site inspection, in accordance with workplace procedures
	1.3 Resources are identified and obtained, in accordance with workplace procedures
	1.4 Potential hazards are identified and risk control measures are selected, in accordance with workplace procedures
	1.5 Storage, conveyance and control hydro system work is sequenced and prioritised, in accordance with workplace procedures
2 Supply water for power generation	**2.1** Inspections of hydro storage and conveyance systems are scheduled and problems are reported and monitored, in accordance with workplace procedures
	2.2 Water quality is monitored and recorded, in accordance with workplace procedures
	2.3 Water flow regulating systems are monitored and adjusted to meet power generation needs, and other user requirements, in accordance with workplace procedures
	2.4 Water flow diversions are determined to facilitate maintenance or emergency activities, in accordance with workplace procedures
	2.5 Dam surveillance procedures are performed, in accordance with workplace procedures
	2.6 Dam levels are maintained and monitored, in accordance with workplace procedures and power generation system

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		requirements
	2.7	Functional tests of equipment are undertaken, in accordance with manufacturers' specifications and workplace procedures
3 Implement flood control procedures	**3.1**	Potential flood conditions are determined using data collected and reports communicated, in accordance with workplace procedures
	3.2	Flood control procedures are implemented, in accordance with workplace procedures
	3.3	Flood control outcomes are monitored, recorded and reported to appropriate personnel and are reviewed, in accordance with workplace procedures
4 Complete documentation	**4.1**	Equipment problems, movements and status are reported, in accordance with workplace procedures
	4.2	Documentation is updated, in accordance with workplace procedures

Foundation Skills

Foundation skills essential to performance are explicit in the performance criteria of this unit of competency.

Range of Conditions

Range is restricted to essential operating conditions and any other variables essential to the work environment.

Non-essential conditions may be found in the Companion Volume Implementation Guide.

Unit Mapping Information

This unit replaces and is equivalent to UEPOPS344B Conduct water conveyance and control.

Links

Companion Volume implementation guides are found in VETNet - https://vetnet.gov.au/Pages/TrainingDocs.aspx?q=1715b9fa-e7bd-441c-bb8d-cf22c9c825a8

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Assessment Requirements for UEPOPS344 Conduct water conveyance and control

Modification History

Release 1. This is the first release of this unit of competency in the UEP Generation Training Package.

Performance Evidence

Evidence required to demonstrate competence in this unit must be relevant to and satisfy all the requirements of the elements, performance criteria and range of conditions on at least two separate occasions and includes:

- applying Work, Health and Safety (WHS)/Occupational Health and Safety (OHS) requirements including:
  - emergency procedures
  - risk control measures
  - safe working practices
- communicating with personnel
- completing documentation using documenting, reporting and recording procedures
- implementing legislation, industry standards, codes of practice and regulations
- interpreting manufacturers' specifications and manuals
- managing water supplies for hydro power generation
- planning and preparing for work
- responding to abnormal storage, conveyance and control hydro system operating conditions
- using flood control
- utilising testing and diagnostic techniques
- working with water control systems

Knowledge Evidence

Evidence required to demonstrate competence in this unit must be relevant to and satisfy all the requirements of the elements, performance criteria and range of conditions and includes knowledge of:

- hydro equipment operation including capacity and limitations
- hydro power generating plant and equipment, its location and operating parameters
- hydroelectric generation including hydro turbine, hydro turbine governor and hydro generator types and characteristics
- implementation of flood control
- legislation, industry standards, codes of practice and regulations
- management of water supplies for hydro generation

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- manufacturers' specifications and manuals
- typical arrangements of hydro power production plant
- water control systems
- WHS/OHS legislated requirements including:
  - emergency procedures
  - risk control measures
  - safe working practices
- workplace documentation
- workplace policies and procedures

Assessment Conditions

As a minimum, assessors must satisfy applicable regulatory requirements, which include requirements in the Standards for Registered Training Organisations current at the time of assessment.

As a minimum, assessment must satisfy applicable regulatory requirements, which include requirements in the Standards for Registered Training Organisations current at the time of assessment.

Assessment processes and techniques must be appropriate to the language, literacy and numeracy requirements of the work being performed and the needs of the candidate.

Assessment must occur in workplace operational situations. Where this is not appropriate, assessment must occur in simulated workplace operational situations that reflect workplace conditions.

Resources for assessment must include access to:

- a range of relevant exercises, case studies and/or other simulations
- relevant and appropriate materials, tools, equipment and personal protective equipment currently used in industry
- applicable documentation including workplace procedures, industry standards, equipment specifications, regulations, codes of practice and operation manuals.

Links

Companion Volume implementation guides are found in VETNet - https://vetnet.gov.au/Pages/TrainingDocs.aspx?q=1715b9fa-e7bd-441c-bb8d-cf22c9c825a8

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UEPOPS345 Implement dam safety surveillance procedures

Modification History

Release 1. This is the first release of this unit of competency in the UEP Generation Training Package.

Application

This unit involves the skills and knowledge required for the scheduling, implementation and reporting of dam safety surveillance.

Surveillance of dams is undertaken to ensure they are operating safely. Reports on dam safety are also required to meet the power generation facility's legislative requirements.

Competency in this unit requires the ability to plan work, implement dam safety surveillance and complete safety surveillance reports. Individuals will, in general, work as an operator, in a power generation facility.

No licensing, legislative or certification requirements apply to this unit at the time of publication.

Note: Workplace practice

The application of the skills and knowledge described in this unit may require a licence or training permit to practice in the workplace where work is carried out on gas and electrical installations. Additional conditions may apply under state and territory legislative and regulatory licensing requirements.

Pre-requisite Unit

There are no prerequisite units.

Competency Field

Operations

Unit Sector

Electricity generation

Elements and Performance Criteria

ELEMENTS	PERFORMANCE CRITERIA
Elements describe the essential	Performance criteria describe the performance needed to

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outcomes.	demonstrate achievement of the element.
1 Plan and prepare for dam surveillance	**1.1** Work, Health and Safety (WHS)/Occupational Health and Safety (OHS) regulations, legislative requirements, industry standards, codes of practice, manufacturers' specifications, environmental obligations and workplace procedures are identified, applied and monitored
	1.2 Resources are identified and obtained, in accordance with workplace procedures
	1.4 Industry standards and regulatory requirements for dam surveillance are identified and interpreted, in accordance with workplace procedures
	1.5 Monitoring frequency and sites for dam surveillance are determined, in accordance with workplace procedures and site requirements
	1.6 Instrument requirements and data collection methods are identified, in accordance with workplace procedures
2 Conduct dam safety surveillance	**2.1** Dam safety surveillance processes and procedures are implemented, in accordance with workplace procedures
	2.2 Data from instruments and personnel is collected and processed, in accordance with workplace procedures
	2.3 Test and measurement instruments are used, in accordance with workplace procedures, manufacturers' instructions and site requirements
	2.4 Abnormal conditions or defects are identified and reported to appropriate personnel, in accordance with workplace procedures
3 Complete safety surveillance reports	**3.1** Calibration of instruments is checked after use, in accordance with workplace procedures and manufacturers' specification
	3.2 Dam surveillance reporting and documentation is undertaken, in accordance with workplace procedures and legislative requirements

Foundation Skills

Foundation skills essential to performance are explicit in the performance criteria of this unit of competency.

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Range of Conditions

Range is restricted to essential operating conditions and any other variables essential to the work environment.

Non-essential conditions may be found in the Companion Volume Implementation Guide.

Unit Mapping Information

This unit replaces and is equivalent to UEPOPS345B Implement dam safety surveillance procedures.

Links

Companion Volume implementation guides are found in VETNet - https://vetnet.gov.au/Pages/TrainingDocs.aspx?q=1715b9fa-e7bd-441c-bb8d-cf22c9c825a8

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Assessment Requirements for UEPOPS345 Implement dam safety surveillance procedures

Modification History

Release 1. This is the first release of this unit of competency in the UEP Generation Training Package.

Performance Evidence

Evidence required to demonstrate competence in this unit must be relevant to and satisfy all the requirements of the elements, performance criteria and range of conditions on at least two separate occasions and includes:

- applying Work, Health and Safety (WHS)/Occupational Health and Safety (OHS) requirements including:
  - emergency procedures
  - hazard identification
  - risk control measures
  - safe working practices
- collecting, processing and analysing data
- communicating with personnel
- completing dam safety surveillance reports using documentation procedures
- implementing legislation, industry standards, codes of practice and regulations
- inspecting dams
- interpreting manufacturers' specifications and manuals
- planning for dam surveillance
- reading dam drawings, plans and charts
- undertaking dam safety surveillance
- using equipment and instruments including testing and recording equipment

Knowledge Evidence

Evidence required to demonstrate competence in this unit must be relevant to and satisfy all the requirements of the elements, performance criteria and range of conditions and includes knowledge of:

- dam design principles
- dam, types and characteristics including
- data collection methods and techniques
- hydro power plant and equipment, its location and operating parameters
- legislation, industry standards, codes of practice and regulations

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- manufacturers' specifications and manuals
- required responses to dam surveillance findings
- surveillance of dams
- test and record equipment
- typical arrangements of hydro power production plant
- WHS/OHS legislated requirements including:
  - emergency procedures
  - hazard identification
  - risk control measures
  - safe working practices
- workplace documentation
- workplace policies and procedures

Assessment Conditions

As a minimum, assessors must satisfy applicable regulatory requirements, which include requirements in the Standards for Registered Training Organisations current at the time of assessment.

As a minimum, assessment must satisfy applicable regulatory requirements, which include requirements in the Standards for Registered Training Organisations current at the time of assessment.

Assessment processes and techniques must be appropriate to the language, literacy and numeracy requirements of the work being performed and the needs of the candidate.

Assessment must occur in workplace operational situations. Where this is not appropriate, assessment must occur in simulated workplace operational situations that reflect workplace conditions.

Resources for assessment must include access to:

- a range of relevant exercises, case studies and/or other simulations
- relevant and appropriate materials, tools, equipment and personal protective equipment currently used in industry
- applicable documentation including workplace procedures, industry standards, equipment specifications, regulations, codes of practice and operation manuals.

Links

Companion Volume implementation guides are found in VETNet - https://vetnet.gov.au/Pages/TrainingDocs.aspx?q=1715b9fa-e7bd-441c-bb8d-cf22c9c825a8

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UEPOPS346 Conduct non-routine operational testing

Modification History

Release 1. This is the first release of this unit of competency in the UEP Generation Training Package.

Application

This unit involves the skills and knowledge required to conduct testing of power generation plant and associated equipment which may be of a non-routine nature.

An operational check is the verification that a group of components are safely working together. Operational checks consist of running in-service electrical plant to ensure that all the systems function together.

Competency in this unit requires the ability to plan for plant in-service checks, carry out in-service electrical checks, carry out corrective actions and complete work. Individuals will, in general, work as an operator in a power generation facility.

Power generation plant operators are typically trained and authorised to isolate, prepare plant and issue permits to work.

No licensing, legislative or certification requirements apply to this unit at the time of publication.

Note: Workplace practice

The application of the skills and knowledge described in this unit may require a licence or training permit to practice in the workplace where work is carried out on gas and electrical installations. Additional conditions may apply under state and territory legislative and regulatory licensing requirements.

Pre-requisite Unit

There are no prerequisite units.

Competency Field

Operations

Unit Sector

Electricity generation

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Elements and Performance Criteria

ELEMENTS	PERFORMANCE CRITERIA
Elements describe the essential outcomes.	Performance criteria describe the performance needed to demonstrate achievement of the element.
1 Prepare for testing	**1.1** Safety issues and Work, Health and Safety (WHS)/Occupational Health and Safety (OHS) regulations are identified, in accordance with workplace procedures
	1.2 Operational test requirements are identified, in accordance with workplace procedures
	1.3 Operational test procedures are determined and monitoring equipment requirements are identified, in accordance with workplace procedures and testing objectives
	1.4 Access to power generating plant is determined, in accordance with workplace procedures
2 Perform non-routine testing	**2.1** Operational testing is performed, in accordance with workplace procedures, industry standards and code of practice
	2.2 Isolations are confirmed, where appropriate, in accordance with workplace procedures
	2.3 Power generating plant is observed and corrective action is taken, in accordance with workplace procedures, when response does not meet with operating parameters, plant integrity or personnel safety
	2.4 Operational testing is completed and power generating plant is returned to required operational status, in accordance with workplace procedures
3 Complete work	**3.1** Appropriate personnel are notified of completion of testing, in accordance with workplace procedures
	3.2 Power generating plant problems or abnormalities are reported, in accordance with workplace procedures
	3.3 Operational test results are interpreted and documented, in accordance with workplace procedures

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Foundation Skills

Foundation skills essential to performance are explicit in the performance criteria of this unit of competency.

Range of Conditions

Range is restricted to essential operating conditions and any other variables essential to the work environment.

Non-essential conditions may be found in the Companion Volume Implementation Guide.

Unit Mapping Information

This unit replaces and is equivalent to UEPOPS346B Conduct non-routine operational testing.

Links

Companion Volume implementation guides are found in VETNet - https://vetnet.gov.au/Pages/TrainingDocs.aspx?q=1715b9fa-e7bd-441c-bb8d-cf22c9c825a8

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Assessment Requirements for UEPOPS346 Conduct non-routine operational testing

Modification History

Release 1. This is the first release of this unit of competency in the UEP Generation Training Package.

Performance Evidence

Evidence required to demonstrate competence in this unit must be relevant to and satisfy all the requirements of the elements, performance criteria and range of conditions on at least two separate occasions and includes:

- applying Work, Health and Safety (WHS)/Occupational Health and Safety (OHS) requirements including:
  - emergency procedures
  - risk control measures
  - safe working practices
- communicating with personnel
- completing work
- conducting non-routine operational testing using testing techniques and procedures
- identifying power generating plant status
- implementing legislation, industry standards, codes of practice and regulations
- locating power generating plant and equipment
- preparing for testing
- recognising abnormal power generating plant operating conditions
- restoring normal power generating plant operating conditions
- using testing equipment
- utilising data analysis techniques and tools
- working with permit to work system

Knowledge Evidence

Evidence required to demonstrate competence in this unit must be relevant to and satisfy all the requirements of the elements, performance criteria and range of conditions and includes knowledge of:

- legislation, industry standards, codes of practice and regulations
- operational requirements of power generating plant and/or associated equipment
- permit to work system
- power generating plant and equipment, its location and operating parameters

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- power generating plant status
- testing procedures and techniques
- testing techniques and procedures
- typical arrangements of power production plant
- WHS/OHS legislated requirements including:
  - emergency procedures
  - risk control measures
  - safe working practices
- workplace documentation
- workplace policies and procedures

Assessment Conditions

As a minimum, assessors must satisfy applicable regulatory requirements, which include requirements in the Standards for Registered Training Organisations current at the time of assessment.

As a minimum, assessment must satisfy applicable regulatory requirements, which include requirements in the Standards for Registered Training Organisations current at the time of assessment.

Assessment processes and techniques must be appropriate to the language, literacy and numeracy requirements of the work being performed and the needs of the candidate.

Assessment must occur in workplace operational situations. Where this is not appropriate, assessment must occur in simulated workplace operational situations that reflect workplace conditions.

Resources for assessment must include access to:

- a range of relevant exercises, case studies and/or other simulations
- relevant and appropriate materials, tools, equipment and personal protective equipment currently used in industry
- applicable documentation including workplace procedures, industry standards, equipment specifications, regulations, codes of practice and operation manuals.

Links

Companion Volume implementation guides are found in VETNet - https://vetnet.gov.au/Pages/TrainingDocs.aspx?q=1715b9fa-e7bd-441c-bb8d-cf22c9c825a8

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UEPOPS347 Operate and monitor supervisory, control and data acquisition systems

Modification History

Release 1. This is the first release of this unit of competency in the UEP Generation Training Package.

Application

This unit involves the skills and knowledge required to undertake monitoring and operation of screen based Supervisory, Control and Data Acquisition (SCADA) systems.

SCADA is a control system that uses computers, networked data communications and graphic interfaces. It may also use other peripheral devices to interface with process plant and/or machinery in power generation facilities.

Competency in this unit requires the ability to operate SCADA, monitor and interpret information and enhance screen display. Individuals will, in general, work under supervision, in a power generation facility as an operator.

Power generation plant operators are typically trained and authorised to isolate, prepare plant and issue permits to work.

No licensing, legislative or certification requirements apply to this unit at the time of publication.

Note: Workplace practice

The application of the skills and knowledge described in this unit may require a licence or training permit to practice in the workplace where work is carried out on gas and electrical installations. Additional conditions may apply under state and territory legislative and regulatory licensing requirements.

Pre-requisite Unit

There are no prerequisite units.

Competency Field

Operations

Unit Sector

Electricity generation

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Elements and Performance Criteria

ELEMENTS	PERFORMANCE CRITERIA
Elements describe the essential outcomes.	Performance criteria describe the performance needed to demonstrate achievement of the element.
1 Operate SCADA screen displays	**1.1** Safety issues related to operating and monitoring a Supervisory Control and Data Acquisition (SCADA) system are identified, in accordance with workplace procedures and Work, Health and Safety (WHS)/Occupational Health and Safety (OHS) regulations and legislative requirements
	1.2 SCADA system requirements are identified, in accordance with workplace procedures, from appropriate personnel and documentation
	1.3 Screen displays and applications are identified and retrieved, in accordance with workplace procedures and SCADA system requirements
	1.4 Functions available from the screen based equipment are identified and selected, in accordance with workplace procedures and SCADA system requirements
	1.5 Functions available from screen based equipment are utilised, in accordance with workplace procedures and SCADA system requirements
2 Monitor and interpret SCADA information	**2.1** Screen displays are monitored, in accordance with workplace procedures and SCADA system requirements
	2.2 Abnormal values or faults are identified by analysis of information obtained from screen displays, in accordance with workplace procedures and SCADA system requirements
	2.3 Corrective action is taken, in accordance with workplace procedures and SCADA system requirements
	2.4 Alarms are acknowledged, prioritised and responded to in accordance with workplace procedures and SCADA system requirements
3 Enhance SCADA screen display	**3.1** Requirements for the development of new screen displays are identified and confirmed, in accordance with workplace procedures and SCADA system requirements

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3.2	New screen displays are researched, assessed and confirmed with appropriate personnel, in accordance with workplace procedures and SCADA system requirements

Foundation Skills

Foundation skills essential to performance are explicit in the performance criteria of this unit of competency.

Range of Conditions

Range is restricted to essential operating conditions and any other variables essential to the work environment.

Non-essential conditions may be found in the Companion Volume Implementation Guide.

Unit Mapping Information

This unit replaces and is equivalent to UEPOPS347B Operate and monitor supervisory, control and data acquisition systems.

Links

Companion Volume implementation guides are found in VETNet - https://vetnet.gov.au/Pages/TrainingDocs.aspx?q=1715b9fa-e7bd-441c-bb8d-cf22c9c825a8

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Assessment Requirements for UEPOPS347 Operate and monitor supervisory, control and data acquisition systems

Modification History

Release 1. This is the first release of this unit of competency in the UEP Generation Training Package.

Performance Evidence

Evidence required to demonstrate competence in this unit must be relevant to and satisfy all the requirements of the elements, performance criteria and range of conditions on at least two separate occasions and includes:

- applying legislation, industry standards, codes of practice and regulations
- applying Work, Health and Safety (WHS)/Occupational Health and Safety (OHS) requirements including:
  - emergency procedures
  - risk control measures
  - safe work practices
- communicating with personnel
- enhancing screen display
- managing screen based equipment including the full range of applications
- monitoring and interpreting information from Supervisory Control and Data Acquisition (SCADA)
- operating screen displays
- responding and prioritising response to alarms
- using manufacturers' specifications and manuals

Knowledge Evidence

Evidence required to demonstrate competence in this unit must be relevant to and satisfy all the requirements of the elements, performance criteria and range of conditions and includes knowledge of:

- alarm systems
- Distributed Control System (DCS)
- legislation, industry standards, codes of practice and regulations
- manufacturers' specifications and manuals
- remote telemetry and data acquisition
- Supervisory Control and Data Acquisition (SCADA) system
- Windows operating system
- WHS/OHS legislated requirements including:

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  - emergency procedures
  - risk control measures
  - safe work practices
- workplace documentation
- workplace policies and procedures

Assessment Conditions

As a minimum, assessors must satisfy applicable regulatory requirements, which include requirements in the Standards for Registered Training Organisations current at the time of assessment.

As a minimum, assessment must satisfy applicable regulatory requirements, which include requirements in the Standards for Registered Training Organisations current at the time of assessment.

Assessment processes and techniques must be appropriate to the language, literacy and numeracy requirements of the work being performed and the needs of the candidate.

Assessment must occur in workplace operational situations. Where this is not appropriate, assessment must occur in simulated workplace operational situations that reflect workplace conditions.

Resources for assessment must include access to:

- a range of relevant exercises, case studies and/or other simulations
- relevant and appropriate materials, tools, equipment and personal protective equipment currently used in industry
- applicable documentation including workplace procedures, industry standards, equipment specifications, regulations, codes of practice and operation manuals.

Links

Companion Volume implementation guides are found in VETNet - https://vetnet.gov.au/Pages/TrainingDocs.aspx?q=1715b9fa-e7bd-441c-bb8d-cf22c9c825a8

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UEPOPS349 Operate local H.V. switchgear

Modification History

Release 1. This is the first release of this unit of competency in the UEP Generation Training Package.

Application

This unit involves the skills and knowledge required to undertake the local operation of High Voltage (H.V.) switchgear devices.

A switchgear is a combination of electrical disconnect switches, fuses or circuit breakers used to control, protect and isolate electrical equipment.

Competency in this unit requires the ability to plan and prepare work, conducting H.V. switchgear operations, validating H.V. switchgear integrity and completing documentation. Individuals will, in general, work under supervision, in a power generation facility as an operator.

Power generation plant operators are typically trained and authorised to isolate, prepare plant and issue permits to work.

No licensing, legislative or certification requirements apply to this unit at the time of publication.

Note: Workplace practice

The application of the skills and knowledge described in this unit may require a licence or training permit to practice in the workplace where work is carried out on gas and electrical installations. Additional conditions may apply under state and territory legislative and regulatory licensing requirements.

Pre-requisite Unit

There are no prerequisite units.

Competency Field

Operations

Unit Sector

Electricity generation

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Elements and Performance Criteria

ELEMENTS	PERFORMANCE CRITERIA
Elements describe the essential outcomes.	Performance criteria describe the performance needed to demonstrate achievement of the element.
1 Prepare to operate High Voltage (H.V.) switchgear	**1.1** Work requirements are identified and confirmed with appropriate personnel, in accordance with workplace procedures
	1.2 Safety precautions when operating High Voltage (H.V.) switchgears are identified, in accordance with Work, Health and Safety (WHS)/Occupational Health and Safety (OHS) regulations, industry standards and workplace procedures
	1.3 Identify H.V. switch gear type and determine correct operation, in accordance with workplace procedures
	1.4 Examine and assess H.V. switchgear conditions for safe operation, in accordance with workplace procedures
	1.5 Suppress H.V. switchgear related protection, where necessary, in accordance with workplace procedures
	1.6 Personnel participating in work are briefed and roles and responsibilities are confirmed, in accordance with workplace procedures
2 Conduct H.V. switch gear operations	**2.1** Mechanical operation and limitations of equipment is identified, in accordance with workplace procedures
	2.2 Implications of proposed work actions are identified, in accordance with workplace procedures
	2.3 H.V. switchgear is operated and its' status is confirmed, in accordance with workplace procedures
	2.4 H.V. switchgear racking, testing, isolation, circuit earthing and reinstatement processes are carried out, in accordance with manufacturers' instructions and workplace procedures
	2.5 Test equipment integrity is confirmed, and H.V. switchgear is de-energised, in accordance with workplace procedures
3 Validate H.V. switchgear	**3.1** H.V. switchgear is inspected for safe operation, in

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integrity		accordance with workplace procedures
	3.2	H.V. switchgear environment is inspected, in accordance with workplace procedures, to ensure it meets all statutory and industry requirements
4 Complete documentation	**4.1**	H.V switchgear status is reported, in accordance with workplace procedures
	4.2	Documentation is updated, in accordance with workplace procedures

Foundation Skills

Foundation skills essential to performance are explicit in the performance criteria of this unit of competency.

Range of Conditions

Range is restricted to essential operating conditions and any other variables essential to the work environment.

Non-essential conditions may be found in the Companion Volume Implementation Guide.

Unit Mapping Information

This unit replaces and is equivalent to UEPOPS349B Operate local H.V. switchgear

Links

Companion Volume implementation guides are found in VETNet - https://vetnet.gov.au/Pages/TrainingDocs.aspx?q=1715b9fa-e7bd-441c-bb8d-cf22c9c825a8

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Assessment Requirements for UEPOPS349 Operate local H.V. switchgear

Modification History

Release 1. This is the first release of this unit of competency in the UEP Generation Training Package.

Performance Evidence

Evidence required to demonstrate competence in this unit must be relevant to and satisfy all the requirements of the elements, performance criteria and range of conditions on at least two separate occasions and includes:

- applying Work, Health and Safety (WHS)/Occupational Health and Safety (OHS) regulations including:
  - emergency procedures
  - hazard identification
  - Personal Protective Equipment (PPE)
  - risk control measures
  - safe working practices
- communicating with personnel
- completing documentation
- de-energising H.V. switchgear
- identifying H.V. switchgear plant status
- implementing legislation, industry standards, codes of practice and regulations
- interpreting manufacturers' specifications, diagrams and manuals
- isolating and earthing H.V. switchgear and equipment
- locating H.V. switchgear and equipment
- operating H.V. switchgear within design parameters
- organising resources and equipment
- planning H.V. switchgear work
- recognising abnormal H.V. switch gear operations
- reporting on H.V. switchgear status
- using High Voltage (H.V.) electrical operational procedures and practices
- working with permit to work system

Knowledge Evidence

Evidence required to demonstrate competence in this unit must be relevant to and satisfy all the requirements of the elements, performance criteria and range of conditions and includes

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knowledge of:

- H.V switchgear operational practices
- H.V. electrical operation practices
- H.V. switchgear plant and equipment, its location and operating parameters
- legislation, industry standards, codes of practice and regulations
- manufacturers' specifications, diagrams and manuals
- operation and implication of H.V. switchgears
- permit to work system
- switchgear types and characteristics
- WHS/OHS regulations including:
  - emergency procedures
  - hazard identification
  - Personal Protective Equipment (PPE)
  - risk control measures
  - safe working practices
- workplace documentation
- workplace policies and procedures

Assessment Conditions

As a minimum, assessors must satisfy applicable regulatory requirements, which include requirements in the Standards for Registered Training Organisations current at the time of assessment.

As a minimum, assessment must satisfy applicable regulatory requirements, which include requirements in the Standards for Registered Training Organisations current at the time of assessment.

Assessment processes and techniques must be appropriate to the language, literacy and numeracy requirements of the work being performed and the needs of the candidate.

Assessment must occur in workplace operational situations. Where this is not appropriate, assessment must occur in simulated workplace operational situations that reflect workplace conditions.

Resources for assessment must include access to:

- a range of relevant exercises, case studies and/or other simulations
- relevant and appropriate materials, tools, equipment and personal protective equipment currently used in industry
- applicable documentation including workplace procedures, industry standards, equipment specifications, regulations, codes of practice and operation manuals.

Links

Companion Volume implementation guides are found in VETNet - https://vetnet.gov.au/Pages/TrainingDocs.aspx?q=1715b9fa-e7bd-441c-bb8d-cf22c9c825a8

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UEPOPS351 Operate H.V. condition changing apparatus

Modification History

Release 1. This is the first release of this unit of competency in the UEP Generation Training Package.

Application

This unit involves the skills and knowledge required to undertake the operation of all High Voltage (H.V.) condition changing apparatus.

H.V. condition changing apparatus can include on and off load transformer tap changers, capacitor banks, rotary converters, voltage regulators, reactors, current limiters, rectifiers and transformers. H.V. changing apparatus works within system parameters such as voltage, current, frequency, volt ampere reactive load and equipment capability.

Competency in this unit requires the ability to plan and prepare work, operate H.V. condition change apparatus and report on H.V. condition during operation. Individuals will, in general, work under supervision, in a power generation facility as an operator.

Power generation plant operators are typically trained and authorised to isolate, prepare plant and issue permits to work.

No licensing, legislative or certification requirements apply to this unit at the time of publication.

Note: Workplace practice

The application of the skills and knowledge described in this unit may require a licence or training permit to practice in the workplace where work is carried out on gas and electrical installations. Additional conditions may apply under state and territory legislative and regulatory licensing requirements.

Pre-requisite Unit

There are no prerequisite units.

Competency Field

Operations

Unit Sector

Electricity generation

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Elements and Performance Criteria

ELEMENTS	PERFORMANCE CRITERIA
Elements describe the essential outcomes.	Performance criteria describe the performance needed to demonstrate achievement of the element.
1 Prepare to operate H.V. condition changing apparatus	**1.1** Safety requirements for operating High Voltage (H.V.) condition changing apparatus are adhered to, in accordance with Work, Health and Safety (WHS)/Occupational Health and Safety (OHS) regulations, legislative requirements, industry standards, manufacturers' specifications and workplace procedures
	1.2 Location of H.V. condition changing apparatus is determined from plans, drawings, system diagrams and maps, in accordance with workplace procedures
	1.3 H.V. condition changing apparatus to be operated, is identified and confirmed, with relevant personnel, in accordance with workplace procedures
	1.4 Condition and status of H.V. condition changing apparatus is determined visually, in accordance with workplace procedures
	1.5 H.V. condition changing apparatus is prepared for operation, in accordance with workplace procedures
2 Conduct H.V. condition changing apparatus operation	**2.1** Relevant personnel are advised of progress during H.V. condition changing apparatus operation, in accordance with workplace procedures
	2.2 Conditions are evaluated prior to H.V. changing apparatus operation, in accordance with workplace procedures
	2.3 H.V. condition changing apparatus is operated in accordance with workplace procedures and manufacturers' recommendations
	2.4 H.V. condition changing apparatus is controlled and adjusted to achieve desired outcomes, in accordance with workplace procedures
	2.5 H.V. condition changing apparatus is examined, in accordance with workplace procedures, to ensure it has functioned correctly

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	2.6	Conditions are re-evaluated to confirm correct H.V. condition changing apparatus outcome, in accordance with workplace procedures
	2.7	H.V. condition changing apparatus is secured, in accordance with workplace procedures
	2.8	Status of H.V. condition changing apparatus is confirmed, in accordance with workplace procedures
3 Complete documentation	**3.1**	Equipment problems, movements, and status are reported, in accordance with workplace procedures
	3.2	Documentation is updated, in accordance with workplace procedures

Foundation Skills

Foundation skills essential to performance are explicit in the performance criteria of this unit of competency.

Range of Conditions

Range is restricted to essential operating conditions and any other variables essential to the work environment.

Non-essential conditions may be found in the Companion Volume Implementation Guide.

Unit Mapping Information

This unit replaces and is equivalent to UEPOPS351B Operate H.V. condition changing apparatus.

Links

Companion Volume implementation guides are found in VETNet - https://vetnet.gov.au/Pages/TrainingDocs.aspx?q=1715b9fa-e7bd-441c-bb8d-cf22c9c825a8

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Assessment Requirements for UEPOPS351 Operate H.V. condition changing apparatus

Modification History

Release 1. This is the first release of this unit of competency in the UEP Generation Training Package.

Performance Evidence

Evidence required to demonstrate competence in this unit must be relevant to and satisfy all the requirements of the elements, performance criteria and range of conditions on at least two separate occasions and includes:

- applying Workplace Health and Safety (WHS)/Occupational Health and Safety (OHS regulations including:
  - emergency procedures
  - Personal Protective Equipment (PPE)
  - risk control measures
  - safety working practices
- communicating with personnel
- completing documentation
- identifying H.V. condition changing apparatus status
- implementing legislation, industry standards, codes of practice and regulations
- interpreting manufacturers' specifications and manuals
- operating High Voltage (H.V.) apparatus
- planning H.V. condition changing apparatus work
- using manufacturers' specifications and manuals
- working with permit to work system

Knowledge Evidence

Evidence required to demonstrate competence in this unit must be relevant to and satisfy all the requirements of the elements, performance criteria and range of conditions and includes knowledge of:

- legislation, industry standards, codes of practice and regulations
- manufacturers' specifications and manuals
- permit to work system
- plant and equipment, its location and operating parameters
- typical arrangement for power generation plant
- WHS/ OHS regulations including:

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  - emergency procedures
  - Personal Protective Equipment (PPE)
  - risk control measures
  - safety working practices
- workplace documentation
- workplace policy and procedures

Assessment Conditions

As a minimum, assessors must satisfy applicable regulatory requirements, which include requirements in the Standards for Registered Training Organisations current at the time of assessment.

As a minimum, assessment must satisfy applicable regulatory requirements, which include requirements in the Standards for Registered Training Organisations current at the time of assessment.

Assessment processes and techniques must be appropriate to the language, literacy and numeracy requirements of the work being performed and the needs of the candidate.

Assessment must occur in workplace operational situations. Where this is not appropriate, assessment must occur in simulated workplace operational situations that reflect workplace conditions.

Resources for assessment must include access to:

- a range of relevant exercises, case studies and/or other simulations
- relevant and appropriate materials, tools, equipment and personal protective equipment currently used in industry
- applicable documentation including workplace procedures, industry standards, equipment specifications, regulations, codes of practice and operation manuals.

Links

Companion Volume implementation guides are found in VETNet - https://vetnet.gov.au/Pages/TrainingDocs.aspx?q=1715b9fa-e7bd-441c-bb8d-cf22c9c825a8

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UEPOPS352 Conduct operational checks on in-service mechanical plant

Modification History

Release 1. This is the first release of this unit of competency in the UEP Generation Training Package.

Application

This unit involves the skills and knowledge required to conduct operational checks on in-service mechanical plant. Mechanical plant refers to the infrastructure used in the operation and maintenance of power generating facilities.

An operational check is the verification that a group of components are working together. An operational check consists of running in-service mechanical plant to ensure that all the systems function together safely.

Competency in this unit requires the ability to plan for plant in-service checks, carry out in-service mechanical checks and complete work. Individuals will, in general, work as an operator in a power generation facility.

Power generation plant operators are typically trained and authorised to isolate, prepare plant and issue permits to work.

No licensing, legislative or certification requirements apply to this unit at the time of publication.

Note: Workplace practice

The application of the skills and knowledge described in this unit may require a licence or training permit to practice in the workplace where work is carried out on gas and electrical installations. Additional conditions may apply under state and territory legislative and regulatory licensing requirements.

Pre-requisite Unit

There are no prerequisite units.

Competency Field

Operations

Unit Sector

Electricity generation

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Elements and Performance Criteria

ELEMENTS	PERFORMANCE CRITERIA
Elements describe the essential outcomes.	Performance criteria describe the performance needed to demonstrate achievement of the element.
1 Plan for mechanical plant in-service checks	**1.1** Safety issues and Work, Health and Safety (WHS)/Occupational Health and Safety (OHS) regulations and industry standards are identified, in accordance with workplace procedures
	1.2 Work, in-service mechanical plant and resource requirements are identified from work orders and documentation, in accordance with workplace procedures
	1.3 In-service mechanical plant status and work requirements are confirmed with appropriate personnel or by site inspection, in accordance with workplace procedures
	1.4 Equipment is checked for correct calibration and operation and materials or components are obtained and inspected, in accordance with workplace procedures
	1.5 Potential hazards are identified and risk control measures are selected, in accordance with workplace procedures
	1.6 Pre-access checks on in-service mechanical plant are carried out, in accordance with workplace procedures and site requirements
2 Carry out in-service mechanical plant check	**2.1** In-service mechanical plant is operated, in accordance with workplace procedures and manufacturers' recommendations
	2.2 In-service mechanical plant checks are monitored and observed, in accordance with workplace procedures, to detect deviations from normal operation
	2.3 Corrective actions are taken to rectify in-service mechanical plant abnormalities, in accordance with manufacturers' recommendations and workplace procedures
	2.4 In-service mechanical plant checks are performed, in accordance with workplace procedures

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	2.5	In-service mechanical plant integrity and personnel safety are maintained, in accordance with workplace procedures, and in consultation with personnel and technical and operational documentation
3 Complete work	**3.1**	In-service mechanical plant checks are completed and control measures are returned to required operational status, where appropriate, in accordance with workplace procedures
	3.2	Appropriate personnel are notified of completion of work, in accordance with workplace procedures
	3.3	In-service mechanical plant problems or abnormalities are reported, in accordance with workplace procedures
	3.4	In-service mechanical plant results are interpreted and documented, in accordance with workplace procedures

Foundation Skills

Foundation skills essential to performance are explicit in the performance criteria of this unit of competency.

Range of Conditions

Range is restricted to essential operating conditions and any other variables essential to the work environment.

Non-essential conditions may be found in the Companion Volume Implementation Guide.

Unit Mapping Information

This unit replaces and is equivalent to UEPOPS352B Conduct operational checks on in-service mechanical plant.

Links

Companion Volume implementation guides are found in VETNet - https://vetnet.gov.au/Pages/TrainingDocs.aspx?q=1715b9fa-e7bd-441c-bb8d-cf22c9c825a8

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Assessment Requirements for UEPOPS352 Conduct operational checks on in-service mechanical plant

Modification History

Release 1. This is the first release of this unit of competency in the UEP Generation Training Package.

Performance Evidence

Evidence required to demonstrate competence in this unit must be relevant to and satisfy all the requirements of the elements, performance criteria and range of conditions on at least two separate occasions and includes:

- applying Work, Health and Safety (WHS)/Occupational Health and Safety (OHS) requirements including:
  - emergency procedures
  - risk control measures
  - safe working practices
- assessing operation of power generating plant
- carrying out in-service mechanical plant check
- communicating with personnel
- completing work
- finding faults including leaks and corrosion
- implementing legislation, industry standards, codes of practice and regulations
- inspecting of in-service mechanical plant equipment associated with electricity generating plant
- planning for in-service mechanical plant in-service check
- undertaking minor performance checking and testing
- utilising manufactures' specifications and manuals
- working with permit to work system

Knowledge Evidence

Evidence required to demonstrate competence in this unit must be relevant to and satisfy all the requirements of the elements, performance criteria and range of conditions and includes knowledge of:

- assessment of operation of electrical plant
- inspection of electrical plant equipment
- legislation, industry standards, codes of practice and regulations
- manufacturers' specifications and manuals
- minor performance checking and testing including fault finding, leaks and corrosion

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- permit to work system
- WHS/OHS legislated requirements including:
  - emergency procedures
  - risk control measures
  - safe working practices
- workplace documentation
- workplace policies and procedures

Assessment Conditions

As a minimum, assessors must satisfy applicable regulatory requirements, which include requirements in the Standards for Registered Training Organisations current at the time of assessment.

As a minimum, assessment must satisfy applicable regulatory requirements, which include requirements in the Standards for Registered Training Organisations current at the time of assessment.

Assessment processes and techniques must be appropriate to the language, literacy and numeracy requirements of the work being performed and the needs of the candidate.

Assessment must occur in workplace operational situations. Where this is not appropriate, assessment must occur in simulated workplace operational situations that reflect workplace conditions.

Resources for assessment must include access to:

- a range of relevant exercises, case studies and/or other simulations
- relevant and appropriate materials, tools, equipment and personal protective equipment currently used in industry
- applicable documentation including workplace procedures, industry standards, equipment specifications, regulations, codes of practice and operation manuals

Links

Companion Volume implementation guides are found in VETNet - https://vetnet.gov.au/Pages/TrainingDocs.aspx?q=1715b9fa-e7bd-441c-bb8d-cf22c9c825a8

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UEPOPS354 Operate and monitor dual fuel firing plant

Modification History

Release 1. This is the first release of this unit of competency in the UEP Generation Training Package.

Application

This unit involves the skills and knowledge required to operate, inspect and monitor dual fuel firing plant in which each fuel source provides a 100% maximum continuous rating.

Dual fuel firing plant must provide the means for maintaining a100% maximum continuous rating by using alternative sources of fuel.

Competency in this unit requires the ability to plan work, operate, test, analyse and report on duel fuel firing plant operations. Individuals will, in general, work under supervision, in a power generation facility as an operator.

Power generation plant operators are typically trained and authorised to isolate, prepare plant and issue permits to work.

No licensing, legislative or certification requirements apply to this unit at the time of publication.

Note: Workplace practice

The application of the skills and knowledge described in this unit may require a licence or training permit to practice in the workplace where work is carried out on gas and electrical installations. Additional conditions may apply under state and territory legislative and regulatory licensing requirements.

Pre-requisite Unit

There are no prerequisite units.

Competency Field

Operations

Unit Sector

Electricity generation

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Elements and Performance Criteria

ELEMENTS	PERFORMANCE CRITERIA
Elements describe the essential outcomes.	Performance criteria describe the performance needed to demonstrate achievement of the element.
1 Plan and prepare work	**1.1** Safety issues are identified, in accordance with Work, Health and Safety (WHS)/Occupational Health and Safety (OHS) regulations, legislative requirements, industry standards and workplace procedures
	1.2 Work requirements are identified from appropriate personnel and documentation, in accordance with workplace procedures
	1.3 Documentation to determine dual fuel firing plant status is assessed and evaluated, in accordance with workplace procedures
	1.4 Inspection, pre-operational tests and field preparations for dual fuel firing service are carried out, in accordance with manufacturers' recommendations and workplace procedures
	1.5 Dual fuel firing plant operational prerequisites are established, in accordance with manufacturers' recommendations and workplace procedures
	1.6 Sequence for recommissioning of dual fuel firing plant is determined, in accordance with workplace procedures and site requirements
2 Conduct operation of duel fuel firing plant	**2.1** Dual fuel firing plant is operated, in accordance with workplace procedures and manufacturers' recommendations
	2.2 Changeover from one fuel source to the other is conducted with minimal effect on load and steam conditions, in accordance with manufacturers' recommendations and workplace procedures
	2.3 Duel fuel firing plant is monitored to detect deviations from normal operating conditions, in accordance with workplace procedures
	2.4 Corrective actions are taken to rectify duel fuel firing plant abnormalities, in accordance with manufacturers' recommendations and workplace procedures

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3 Test, monitor, analyse and report on duel fuel firing plant operation	**3.1**	Tests are performed on duel fuel firing plant, in accordance with workplace procedures
	3.2	Duel fuel firing plant is observed for correct operational response, in accordance with workplace procedures
	3.3	Corrective action is taken, in accordance with workplace procedures, when response is not in accordance with documentation, plant integrity or personnel safety
	3.4	Duel fuel firing plant is returned to required operational status upon completion of testing, in accordance with workplace procedures
4 Analyse duel fuel firing plant faults	**4.1**	Causes of abnormal duel fuel firing plant operating conditions are identified, in accordance with workplace procedures, by analysing technical and operational information
	4.2	Corrective action is taken, in accordance with workplace procedures
	4.3	Duel fuel firing plant integrity and personnel safety is maintained, in accordance with workplace procedures and through consultation with appropriate personnel and technical and operational documentation
5 Monitor and inspect duel fuel firing plant	**5.1**	Duel fuel firing plant to be monitored and inspected is physically identified
	5.2	Duel fuel firing plant is monitored and inspected for normal operation, in accordance with workplace procedures to detect deviations
	5.3	Corrective action is taken, in accordance with workplace procedures
	5.4	Appropriate personnel are notified when defects are detected, in accordance with workplace procedures
6 Complete documentation	**6.1**	Duel fuel firing plant problems, movements, and status are reported, in accordance with workplace procedures
	6.2	Documentation is updated, in accordance with workplace procedures

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Foundation Skills

Foundation skills essential to performance are explicit in the performance criteria of this unit of competency.

Range of Conditions

Range is restricted to essential operating conditions and any other variables essential to the work environment.

Non-essential conditions may be found in the Companion Volume Implementation Guide.

Unit Mapping Information

This unit replaces and is equivalent to UEPOPS354B Operate and monitor dual fuel firing plant.

Links

Companion Volume implementation guides are found in VETNet - https://vetnet.gov.au/Pages/TrainingDocs.aspx?q=1715b9fa-e7bd-441c-bb8d-cf22c9c825a8

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Assessment Requirements for UEPOPS354 Operate and monitor dual fuel firing plant

Modification History

Release 1. This is the first release of this unit of competency in the UEP Generation Training Package.

Performance Evidence

Evidence required to demonstrate competence in this unit must be relevant to and satisfy all the requirements of the elements, performance criteria and range of conditions on at least two separate occasions and includes:

- applying Work, Health and Safety (WHS)/Occupational Health and Safety (OHS) legislated requirements including:
  - emergency procedures
  - risk control measures
  - safe working practices
- communicating with personnel
- completing documentation using recording procedures
- identifying and responding to abnormal plant operating conditions
- implementing legislation, industry standards, codes of practice and regulations
- interpreting manufacturers' specifications and manuals
- monitoring and inspecting dual fuel firing plant
- operating duel fuel firing plant
- organising resources
- planning dual fuel firing plant or equipment for operation
- reporting on dual fuel firing plant status
- testing dual fuel firing plant operationally using diagnostic and data analysis techniques using testing and measurement instruments to identify faults and abnormalities
- working with permit to work system

Knowledge Evidence

Evidence required to demonstrate competence in this unit must be relevant to and satisfy all the requirements of the elements, performance criteria and range of conditions and includes knowledge of:

- dual fuel firing plant and equipment, its location and operating parameters
- dual fuel firing plant status
- legislation, industry standards, codes of practice and regulations
- manufacturers' specifications and manuals

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- permit to work system
- test and fault finding techniques
- typical arrangements for power generation plant
- WHS/OHS legislated requirements including:
  - emergency procedures
  - risk control measures
  - safe working practices
- workplace documentation
- workplace policies and procedures

Assessment Conditions

As a minimum, assessors must satisfy applicable regulatory requirements, which include requirements in the Standards for Registered Training Organisations current at the time of assessment.

As a minimum, assessment must satisfy applicable regulatory requirements, which include requirements in the Standards for Registered Training Organisations current at the time of assessment.

Assessment processes and techniques must be appropriate to the language, literacy and numeracy requirements of the work being performed and the needs of the candidate.

Assessment must occur in workplace operational situations. Where this is not appropriate, assessment must occur in simulated workplace operational situations that reflect workplace conditions.

Resources for assessment must include access to:

- a range of relevant exercises, case studies and/or other simulations
- relevant and appropriate materials, tools, equipment and personal protective equipment currently used in industry
- applicable documentation including workplace procedures, industry standards, equipment specifications, regulations, codes of practice and operation manuals.

Links

Companion Volume implementation guides are found in VETNet - https://vetnet.gov.au/Pages/TrainingDocs.aspx?q=1715b9fa-e7bd-441c-bb8d-cf22c9c825a8

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UEPOPS355 Monitor the implementation of under frequency load shedding

Modification History

Release 1. This is the first release of this unit of competency in the UEP Generation Training Package.

Application

This unit involves the skills and knowledge required to implement and monitor under frequency load shedding for isolated and integrated generation network systems.

Under frequency load shedding is the deliberate shutdown of electric power in a part or parts of the power system to prevent the failure of the entire system. It is generally caused by overloading a power source or problems with a prime mover such as a turbine.

Competency in this unit requires the ability to plan work, set under frequency load shedding, respond to under frequency load shedding operation and the completion of all documentation. Individuals will, in general, work as an operator in a power generation facility.

Power generation plant operators are typically trained and authorised to isolate, prepare plant and issue permits to work.

No licensing, legislative or certification requirements apply to this unit at the time of publication.

Note: Workplace practice

The application of the skills and knowledge described in this unit may require a licence or training permit to practice in the workplace where work is carried out on gas and electrical installations. Additional conditions may apply under state and territory legislative and regulatory licensing requirements.

Pre-requisite Unit

There are no prerequisite units.

Competency Field

Operations

Unit Sector

Electricity generation

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Elements and Performance Criteria

ELEMENTS	PERFORMANCE CRITERIA
Elements describe the essential outcomes.	Performance criteria describe the performance needed to demonstrate achievement of the element.
1 Plan for load shedding	**1.1** Safety issues Work, Health and Safety (WHS)/Occupational Health and Safety(OHS) regulations are identified, in accordance with workplace procedures and site requirements
	1.2 Work tasks, load shedding plant and resource requirements are identified from relevant information and documentation, in accordance with workplace procedures
	1.3 Checks are carried out on under frequency load shedding plant, in accordance with workplace procedures and site requirements
2 Set under frequency load shedding	**2.1** Individual load source data is collated, assessed, evaluated and prioritised, in accordance with workplace procedures
	2.2 Data is assessed against trends, in accordance with workplace procedures, to determine suitability for load shed selection
	2.3 Load data is grouped and summed into stages of priority to match generator or unit output, in accordance with workplace procedures
	2.4 Selected load shedding is implemented, in accordance with workplace procedures
	2.5 Staged load data is monitored and recalculated to detect deviations from parameters, in accordance with workplace procedures
3 Respond to under frequency load shedding operation	**3.1** Load data is monitored and selections are adjusted, in accordance with workplace procedures, to maintain values within permissible parameters
	3.2 Stakeholders are consulted and corrective action is determined for load shedding deviations, in accordance with workplace procedures
4 Complete documentation	**4.1** Load shedding status is reported, in accordance with

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workplace procedures

4.2 Documentation is updated, in accordance with workplace procedures

Foundation Skills

Foundation skills essential to performance are explicit in the performance criteria of this unit of competency.

Range of Conditions

Range is restricted to essential operating conditions and any other variables essential to the work environment.

Non-essential conditions may be found in the Companion Volume Implementation Guide.

Unit Mapping Information

This unit replaces and is equivalent to UEPOPS355B Monitor the implementation of under frequency load shedding.

Links

Companion Volume implementation guides are found in VETNet - https://vetnet.gov.au/Pages/TrainingDocs.aspx?q=1715b9fa-e7bd-441c-bb8d-cf22c9c825a8

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Assessment Requirements for UEPOPS355 Monitor the implementation of under frequency load shedding

Modification History

Release 1. This is the first release of this unit of competency in the UEP Generation Training Package.

Performance Evidence

Evidence required to demonstrate competence in this unit must be relevant to and satisfy all the requirements of the elements, performance criteria and range of conditions on at least two separate occasions and includes:

- analysing power generation plant and system using data using data analysis techniques and tools
- applying Work, Health and Safety (WHS)/Occupational Health and Safety (OHS) requirements including:
- communicating with stakeholders
- implementing legislation, industry standards, codes of practice and regulations
- interpreting remote indications of power generation plant status
- monitoring operation of power generation plant and equipment
- planning and preparing power generation plant and/or equipment for operation
- recognising abnormal power generation plant operating conditions and determining corrective actions
- responding to under frequency load shedding operations including:
  - forecasting system load shifting
  - setting load shedding within operational parameters
- scheduling load shedding to match generator output completing documentation
  - emergency procedures
  - risk control measures
  - safe working practices
- using manufacturers' specifications and manuals
- working with permit to work system

Knowledge Evidence

Evidence required to demonstrate competence in this unit must be relevant to and satisfy all the requirements of the elements, performance criteria and range of conditions and includes knowledge of:

- legislation, industry standards, codes of practice and regulations
- manufacturers' specifications and manuals

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- permit to work system
- power generation under frequency load shedding plant and equipment, its location and operating parameters
- typical arrangements of power production plant including power generation plant operating parameters and status
- under frequency load shedding system components and interactions including:
  - generator capacity
  - load shedding schemes
  - stakeholder communication
- WHS/OHS legislated requirements including:
  - emergency procedures
  - risk control measures
  - safe working practices
- workplace documentation
- workplace policies and procedures

Assessment Conditions

As a minimum, assessors must satisfy applicable regulatory requirements, which include requirements in the Standards for Registered Training Organisations current at the time of assessment.

As a minimum, assessment must satisfy applicable regulatory requirements, which include requirements in the Standards for Registered Training Organisations current at the time of assessment.

Assessment processes and techniques must be appropriate to the language, literacy and numeracy requirements of the work being performed and the needs of the candidate.

Assessment must occur in workplace operational situations. Where this is not appropriate, assessment must occur in simulated workplace operational situations that reflect workplace conditions.

Resources for assessment must include access to:

- a range of relevant exercises, case studies and/or other simulations
- relevant and appropriate materials, tools, equipment and personal protective equipment currently used in industry
- applicable documentation including workplace procedures, industry standards, equipment specifications, regulations, codes of practice and operation manuals.

Links

Companion Volume implementation guides are found in VETNet - https://vetnet.gov.au/Pages/TrainingDocs.aspx?q=1715b9fa-e7bd-441c-bb8d-cf22c9c825a8

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UEPOPS356 Apply environmental and sustainable energy procedures

Modification History

Release 1. This is the first release of this unit of competency in the UEP Generation Training Package.

Application

This unit involves the skills and knowledge required for the implementation of environmental procedures in the workplace. It also includes identifying, assessing and controlling environmental risks and assessing the impact of work related activities.

Environmental risks can include air, soil and water pollution, wildlife and habitat loss and global warming emissions.

Competency in this unit requires the ability to plan for quality control, monitor quality control and complete all documentation. Individuals will, in general, work as an operator, in a power generation facility.

Power generation plant operators are typically trained and authorised to isolate, prepare plant and issue permits to work.

No licensing, legislative or certification requirements apply to this unit at the time of publication.

Note: Workplace practice

The application of the skills and knowledge described in this unit may require a licence or training permit to practice in the workplace where work is carried out on gas and electrical installations. Additional conditions may apply under state and territory legislative and regulatory licensing requirements.

Pre-requisite Unit

There are no prerequisite units.

Competency Field

Operations

Unit Sector

Electricity generation

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Elements and Performance Criteria

ELEMENTS	PERFORMANCE CRITERIA
Elements describe the essential outcomes.	Performance criteria describe the performance needed to demonstrate achievement of the element.
1 Relate environmental procedures to specific work site	**1.1** Environmental and sustainable energy procedures are identified, in accordance with workplace procedures for implementation at work site
	1.2 Environmental and sustainable energy procedures for specific work site are reviewed with appropriate personnel
2 Implement environmental procedures	**2.1** Environmental and sustainable energy procedures are applied to specific work site, in accordance with workplace procedures
	2.2 Environmental risks and impacts are identified, in accordance with workplace procedures
	2.3 Environmental risks and impacts are assessed, in accordance with workplace procedures
	2.4 Environmental risks and impacts are controlled and monitored throughout work activities, in accordance with workplace procedures
	2.5 Environmental incidents are dealt with, in accordance with workplace procedures and emergency procedures and contingency strategies are implemented
	2.6 Environmental and sustainable energy work is conducted, in accordance with workplace procedures and the principles of sustainable energy and energy conservation
	2.7 Provision for recycling or reuse of materials is undertaken, where possible, in accordance with workplace procedures
	2.8 Environmental incidents are reported and recorded, in accordance with workplace procedures
3 Environmental procedures are reported and reviewed	**3.1** Reporting procedures for environmental and sustainable energy processes are monitored, in accordance with workplace procedures, with respect to a specific work or site

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3.2 Environmental risks, potential impacts and incidents are monitored and reported, in accordance with workplace procedures

3.3 Participation and contribution into reviews of environmental and sustainable energy procedures are carried out, in accordance with workplace procedures

Foundation Skills

Foundation skills essential to performance are explicit in the performance criteria of this unit of competency.

Range of Conditions

Range is restricted to essential operating conditions and any other variables essential to the work environment.

Non-essential conditions may be found in the Companion Volume Implementation Guide.

Unit Mapping Information

This unit replaces and is equivalent to UEPOPS356B Apply environmental and sustainable energy procedures.

Links

Companion Volume implementation guides are found in VETNet - https://vetnet.gov.au/Pages/TrainingDocs.aspx?q=1715b9fa-e7bd-441c-bb8d-cf22c9c825a8

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Assessment Requirements for UEPOPS356 Apply environmental and sustainable energy procedures

Modification History

Release 1. This is the first release of this unit of competency in the UEP Generation Training Package.

Performance Evidence

Evidence required to demonstrate competence in this unit must be relevant to and satisfy all the requirements of the elements, performance criteria and range of conditions on at least two separate occasions and includes:

- applying environmental risk assessment processes
- applying Work, Health and Safety (WHS)/Occupational Health and Safety (OHS) requirements including:
  - emergency procedures
  - hazard identification
  - risk control measures
  - safe working practices
- communicating with personnel
- implementing legislation, industry standards, codes of practice and regulations
- recycling and reusing materials
- reporting on environmental incidents
- using manufacturers' specifications and manuals
- utilising environmental and sustainable energy principles and practices
- working with, monitoring and reviewing environmental procedures

Knowledge Evidence

Evidence required to demonstrate competence in this unit must be relevant to and satisfy all the requirements of the elements, performance criteria and range of conditions and includes knowledge of:

- environmental and sustainable energy principles and practices
- environmental incidents
- environmental risk assessment processes
- implementation, monitoring and reviewing environmental procedures
- legislation, industry standards, codes of practice and regulations
- manufacturers' specifications and manuals
- methods of identifying environmental impacts

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- recycling and reuse of materials
- WHS/OHS legislated requirements including
  - emergency procedures
  - hazard identification
  - risk control measures
  - safe working practices
- workplace documentation
- workplace policies and procedures

Assessment Conditions

As a minimum, assessors must satisfy applicable regulatory requirements, which include requirements in the Standards for Registered Training Organisations current at the time of assessment.

As a minimum, assessment must satisfy applicable regulatory requirements, which include requirements in the Standards for Registered Training Organisations current at the time of assessment.

Assessment processes and techniques must be appropriate to the language, literacy and numeracy requirements of the work being performed and the needs of the candidate.

Assessment must occur in workplace operational situations. Where this is not appropriate, assessment must occur in simulated workplace operational situations that reflect workplace conditions.

Resources for assessment must include access to:

- a range of relevant exercises, case studies and/or other simulations
- relevant and appropriate materials, tools, equipment and personal protective equipment currently used in industry
- applicable documentation including workplace procedures, industry standards, equipment specifications, regulations, codes of practice and operation manuals.

Links

Companion Volume implementation guides are found in VETNet - https://vetnet.gov.au/Pages/TrainingDocs.aspx?q=1715b9fa-e7bd-441c-bb8d-cf22c9c825a8

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UEPOPS357 Operate local L.V. switchgear

Modification History

Release 1. This is the first release of this unit of competency in the UEP Generation Training Package.

Application

This unit involves the skills and knowledge required to undertake the local operation of Low Voltage (L.V.) switchgear.

An L.V. switchgear is a combination of electrical disconnect switches, fuses or circuit breakers used to control, protect and isolate electrical equipment. Switchgears de-energise equipment to allow work to be undertaken and to clear faults downstream in electricity power systems.

Competency in this unit requires the ability to plan and prepare L.V. secondary switchgear, operating switchgear and validating, testing and reporting on L.V. switchgear integrity. Individuals will, in general, work under supervision, in a power generation facility as an operator.

Power generation plant operators are typically trained and authorised to isolate, prepare plant and issue permits to work.

No licensing, legislative or certification requirements apply to this unit at the time of publication.

Note: Workplace practice

The application of the skills and knowledge described in this unit may require a licence or training permit to practice in the workplace where work is carried out on gas and electrical installations. Additional conditions may apply under state and territory legislative and regulatory licensing requirements.

Pre-requisite Unit

There are no prerequisite units.

Competency Field

Operations

Unit Sector

Electricity generation

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Elements and Performance Criteria

ELEMENTS	PERFORMANCE CRITERIA
Elements describe the essential outcomes.	Performance criteria describe the performance needed to demonstrate achievement of the element.
1 Prepare to operate Low Voltage (L.V.) switchgear	**1.1** Work requirements are identified and confirmed with appropriate personnel, in accordance with workplace procedures
	1.2 Safety precautions when operating Low Voltage (L.V.) switchgears are identified, in accordance with Work, Health and Safety (WHS)/Occupational Health and Safety (OHS) regulations, legislative requirements, industry standards, manufacturers' specifications and workplace procedures
	1.3 Location of L.V. switchgear is determined from relevant drawings, plans and maps, in accordance with workplace procedures
	1.4 Switchgear type and operating procedure is identified, in accordance with workplace procedures
	1.5 L.V. switchgear condition is assessed for safe operation, in accordance with workplace procedures
	1.6 Related L.V. switchgear protection is suppressed, if and where necessary, in accordance with workplace procedures
2 Conduct L.V. switchgear operation	**2.1** Mechanical operation and limitations of L.V switchgear are identified, in accordance with workplace procedures
	2.2 Implications of L.V. switchgear actions are identified, in accordance with workplace procedures
	2.3 L.V. switchgear is operated and required status is confirmed, in accordance with workplace procedures
	2.4 Racking, testing, isolation, circuit earthing and reinstatement processes are carried out, in accordance with Work, Health and Safety (WHS)/Occupational Health and Safety (OHS) regulations, legislative requirements, industry standards, manufacturers' recommendations and workplace procedures
	2.5 Test equipment's integrity is confirmed, and L.V. switchgear circuit is de-energised, in accordance with

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		workplace procedures
3 Validate and report L.V. switchgear integrity	**3.1**	L.V. switchgear is inspected for safe operation, in accordance with workplace procedures
	3.2	L.V. switchgear environment is inspected to ensure statutory and workplace requirements are met
4 Complete documentation	**4.1**	L.V. switchgear plant problems, movements and status are reported, in accordance with workplace procedures
	4.2	Documentation is updated, in accordance with workplace procedures

Foundation Skills

Foundation skills essential to performance are explicit in the performance criteria of this unit of competency.

Range of Conditions

Range is restricted to essential operating conditions and any other variables essential to the work environment.

Non-essential conditions may be found in the Companion Volume Implementation Guide.

Unit Mapping Information

This unit replaces and is equivalent to UEPOPS357B Operate local L.V. switchgear

Links

Companion Volume implementation guides are found in VETNet - https://vetnet.gov.au/Pages/TrainingDocs.aspx?q=1715b9fa-e7bd-441c-bb8d-cf22c9c825a8

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Assessment Requirements for UEPOPS357 Operate local L.V. switchgear

Modification History

Release 1. This is the first release of this unit of competency in the UEP Generation Training Package.

Performance Evidence

Evidence required to demonstrate competence in this unit must be relevant to and satisfy all the requirements of the elements, performance criteria and range of conditions on at least two separate occasions and includes:

- applying Work, Health and Safety (WHS)/Occupational Health and Safety (OHS) regulations including:
  - emergency procedures
  - Personal Protective Equipment (PPE)
  - risk control measures
  - safe working practices
- communicating with personnel
- completing documentation
- conducting isolation and earthing procedures
- identifying status of L.V. switchgear
- implementing legislation, industry standards, codes of practice and regulations
- operating Low Voltage (L.V.) secondary switchgear using plant drawings and plans
- planning L.V. secondary switchgear work
- preparing and operating L.V. secondary switchgear protection equipment
- recognising abnormal switchgear operations
- using manufacturers' specifications and manuals
- validating switchgear integrity
- working with permit to work system

Knowledge Evidence

Evidence required to demonstrate competence in this unit must be relevant to and satisfy all the requirements of the elements, performance criteria and range of conditions and includes knowledge of:

- abnormal secondary switchgear operations
- isolation and earthing procedures
- L.V. secondary switchgear operations

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- legislation, industry standards, codes of practice and regulations
- manufacturers' specifications and manuals
- permit to work system
- power generating plant, equipment and its location
- typical arrangements for power generation plant
- WHS/ OHS regulations including:
  - emergency procedures
  - Personal Protective Equipment (PPE)
  - risk control measures
  - safe working practices
- workplace documentation
- workplace policies and procedures

Assessment Conditions

As a minimum, assessors must satisfy applicable regulatory requirements, which include requirements in the Standards for Registered Training Organisations current at the time of assessment.

As a minimum, assessment must satisfy applicable regulatory requirements, which include requirements in the Standards for Registered Training Organisations current at the time of assessment.

Assessment processes and techniques must be appropriate to the language, literacy and numeracy requirements of the work being performed and the needs of the candidate.

Assessment must occur in workplace operational situations. Where this is not appropriate, assessment must occur in simulated workplace operational situations that reflect workplace conditions.

Resources for assessment must include access to:

- a range of relevant exercises, case studies and/or other simulations
- relevant and appropriate materials, tools, equipment and personal protective equipment currently used in industry
- applicable documentation including workplace procedures, industry standards, equipment specifications, regulations, codes of practice and operation manuals.

Links

Companion Volume implementation guides are found in VETNet - https://vetnet.gov.au/Pages/TrainingDocs.aspx?q=1715b9fa-e7bd-441c-bb8d-cf22c9c825a8

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UEPOPS358 Monitor and maintain wind farm civil assets

Modification History

Release 1. This is the first release of this unit of competency in the UEP Generation Training Package.

Application

This unit involves the skills and knowledge required to monitor and conduct preventative and remedial maintenance to ensure the integrity of civil assets associated with a wind farm.

Wind farm civil assets include infrastructure such as water treatment facilities, sewer pipelines, roads, utility grids, bridges, tunnels and railways. Civil asset maintenance in a wind power generation system involves the use of strategies to preserve and extend the service life of infrastructure.

Competency in this unit requires the ability to plan work, monitor wind farm civil assets, maintain wind farm civil assets and complete all work. Individuals will, in general, work as an operator, in a power generation facility.

Power generation plant operators are typically trained and authorised to isolate, prepare plant and issue permits to work.

No licensing, legislative or certification requirements apply to this unit at the time of publication.

Note: Workplace practice

The application of the skills and knowledge described in this unit may require a licence or training permit to practice in the workplace where work is carried out on gas and electrical installations. Additional conditions may apply under state and territory legislative and regulatory licensing requirements.

Pre-requisite Unit

There are no prerequisite units.

Competency Field

Operations

Unit Sector

Electricity generation

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Elements and Performance Criteria

ELEMENTS	PERFORMANCE CRITERIA
Elements describe the essential outcomes.	Performance criteria describe the performance needed to demonstrate achievement of the element.
1 Plan and prepare for work	**1.1** Work, Health and Safety (WHS)/Occupational Health and Safety (OHS) standards, legislative requirements, industry standards, codes of practice, manufacturers' specifications, environmental obligations and workplace procedures are identified, applied and monitored
	1.2 Work requirements are identified from work orders and are confirmed with appropriate personnel or by site inspection, in accordance with workplace procedures
	1.3 Resources to satisfy work requirements are identified, obtained and inspected for compliance, in accordance with workplace procedures
	1.4 Potential hazards are identified and risk control measures are selected and implemented, in accordance with workplace procedures
	1.5 Work is sequenced and prioritised, in accordance with workplace procedures and site requirements
2 Monitor wind farm civil assets	**2.1** Inspections of wind farm civil assets are completed, in accordance with workplace procedures and site requirements
	2.2 Inspections of wind farm civil assets are reported, in accordance with workplace procedures and site requirements
	2.3 Defects in wind farm civil assets are reported, in accordance with workplace procedures and site requirements
3 Maintain wind farm civil assets	**3.1** Maintenance of wind farm civil assets is undertaken, in accordance with workplace procedures and site requirements
	3.2 Appropriate tools, equipment or plant required to maintain wind farm civil assets is utilised, in accordance with workplace procedures and manufacturers' specifications

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	3.3	Defects are repaired, in accordance with workplace procedures and site requirements
4 Complete work	**4.1**	Maintenance work is completed and appropriate personnel are notified, in accordance with workplace procedures
	4.2	Work area is cleared of waste, cleaned, restored and secured, in accordance with workplace procedures
	4.3	Wind farm civil asset maintenance tools and equipment are maintained and stored, in accordance with manufacturers' specifications and workplace procedures
	4.4	Work completion details are finalised, in accordance with workplace procedures

Foundation Skills

Foundation skills essential to performance are explicit in the performance criteria of this unit of competency.

Range of Conditions

Range is restricted to essential operating conditions and any other variables essential to the work environment.

Non-essential conditions may be found in the Companion Volume Implementation Guide.

Unit Mapping Information

This unit replaces and is equivalent to UEPOPS358A Monitor and maintain wind farm civil assets.

Links

Companion Volume implementation guides are found in VETNet - https://vetnet.gov.au/Pages/TrainingDocs.aspx?q=1715b9fa-e7bd-441c-bb8d-cf22c9c825a8

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Assessment Requirements for UEPOPS358 Monitor and maintain wind farm civil assets

Modification History

Release 1. This is the first release of this unit of competency in the UEP Generation Training Package.

Performance Evidence

Evidence required to demonstrate competence in this unit must be relevant to and satisfy all the requirements of the elements, performance criteria and range of conditions on at least two separate occasions and includes:

- applying Work, Health and Safety (WHS)/Occupational Health and Safety (OHS) requirements including:
  - emergency procedures
  - risk control measures
  - safe working practices
- clearing waste from work area
- communicating with personnel
- completing work
- identifying and selecting equipment and materials
- implementing legislation, industry standards, codes of practice and regulations
- interpreting manufacturers' specifications and manuals
- monitoring and maintaining wind farm civil assets using monitoring and maintenance procedures
- planning and preparing for work
- storing and maintaining civil asset tools and equipment

Knowledge Evidence

Evidence required to demonstrate competence in this unit must be relevant to and satisfy all the requirements of the elements, performance criteria and range of conditions and includes knowledge of:

- layout of power generation wind farm facility and associated civil assets
- legislation, industry standards, codes of practice and regulations
- manufacturers' specifications and manuals
- typical arrangements of wind farm power plant including wind turbine types and characteristics
- WHS/OHS legislated requirements including:
  - emergency procedures

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  - risk control measures
  - safe working practices
- wind farm civil asset monitoring and maintenance techniques
- workplace documentation
- workplace policies and procedures

Assessment Conditions

As a minimum, assessors must satisfy applicable regulatory requirements, which include requirements in the Standards for Registered Training Organisations current at the time of assessment.

As a minimum, assessment must satisfy applicable regulatory requirements, which include requirements in the Standards for Registered Training Organisations current at the time of assessment.

Assessment processes and techniques must be appropriate to the language, literacy and numeracy requirements of the work being performed and the needs of the candidate.

Assessment must occur in workplace operational situations. Where this is not appropriate, assessment must occur in simulated workplace operational situations that reflect workplace conditions.

Resources for assessment must include access to:

- a range of relevant exercises, case studies and/or other simulations
- relevant and appropriate materials, tools, equipment and personal protective equipment currently used in industry
- applicable documentation including workplace procedures, industry standards, equipment specifications, regulations, codes of practice and operation manuals.

Links

Companion Volume implementation guides are found in VETNet - https://vetnet.gov.au/Pages/TrainingDocs.aspx?q=1715b9fa-e7bd-441c-bb8d-cf22c9c825a8

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UEPOPS359 Monitor climatic conditions for renewable energy production

Modification History

Release 1. This is the first release of this unit of competency in the UEP Generation Training Package.

Application

This unit involves the skills and knowledge required to monitor weather and climate conditions for renewable energy production. It also includes taking suitable preventative actions to ensure the safety of personnel, power generation plant and equipment in adverse weather conditions.

Renewable energy can be generated from natural resources such as sun light, wind, rain, tides and geothermal heat which are naturally replenished.

Competency in this unit requires the ability to interpret weather and climate information, carry out preventative actions, monitor weather and climate during adverse conditions, return to normal operations and complete all documentation. Individuals will, in general, work as an operator, in a power generation facility.

No licensing, legislative or certification requirements apply to this unit at the time of publication.

Note: Workplace practice

The application of the skills and knowledge described in this unit may require a licence or training permit to practice in the workplace where work is carried out on gas and electrical installations. Additional conditions may apply under state and territory legislative and regulatory licensing requirements.

Pre-requisite Unit

There are no prerequisite units.

Competency Field

Operations

Unit Sector

Electricity generation

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Elements and Performance Criteria

ELEMENTS	PERFORMANCE CRITERIA
Elements describe the essential outcomes.	Performance criteria describe the performance needed to demonstrate achievement of the element.
1 Interpret weather and climate information	**1.1** Weather and climate information, including warnings, are monitored, in accordance with workplace procedures to determine likely conditions
	1.2 Potential variations in weather and climate conditions are anticipated and assessed, in accordance with workplace procedures, warnings, weather patterns and historical experience
	1.3 Possible impact of weather and climate on renewable energy plant, equipment and civil assets are identified, in accordance with workplace procedures
	1.4 Stakeholders and key personnel are informed of anticipated impact of weather and climate on renewable energy plant, equipment and civil assets, in accordance with workplace procedures
2 Carry out preventative actions	**2.1** Preventative actions are identified, in accordance with workplace procedures and manufacturers' recommendations
	2.2 Stakeholders and key personnel are consulted in the development of preventative actions, in accordance with workplace procedures
	2.3 Preventative actions are reviewed, in accordance with workplace procedures, to ensure availability of resources, safety of personnel, renewable energy plant and equipment
	2.4 Actions to minimise loss and damage of renewable energy plant, equipment and civil assets are implemented, in accordance with workplace procedures and manufacturers' recommendations
	2.5 Actions to ensure safety of personnel are implemented, in accordance with workplace procedures
3 Monitor weather and climate during adverse conditions	**3.1** Weather and climate information, including warnings, are continually monitored, in accordance with workplace procedures, to determine ongoing suitability

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		of preventative actions
	3.2	Preventative actions are adjusted and revised in relation to weather and climatic changes, in accordance with workplace procedures
4 Return to normal operations	**4.1**	Weather and climate information, including warnings, are monitored, in accordance with workplace procedures, to determine when normal and safe weather conditions have returned
	4.2	Renewable energy plant, equipment and civil assets are inspected for damage, in accordance with workplace procedures and manufacturers' recommendations
	4.3	Renewable energy plant, equipment and civil assets are placed back into service, in accordance with workplace procedures and manufacturers' recommendations
	4.4	Preventative actions are reviewed and recommendations are developed to improve processes, in accordance with workplace procedures
5 Complete documentation	**5.1**	Documentation is updated, in accordance with workplace procedures
	5.2	Completed documentation is forwarded to authorised personnel, in accordance with workplace procedures

Foundation Skills

Foundation skills essential to performance are explicit in the performance criteria of this unit of competency.

Range of Conditions

Range is restricted to essential operating conditions and any other variables essential to the work environment.

Non-essential conditions may be found in the Companion Volume Implementation Guide.

Unit Mapping Information

This unit replaces and is equivalent to UEPOPS359A Monitor Climatic Conditions for Renewable Energy Production.

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Links

Companion Volume implementation guides are found in VETNet - https://vetnet.gov.au/Pages/TrainingDocs.aspx?q=1715b9fa-e7bd-441c-bb8d-cf22c9c825a8

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Assessment Requirements for UEPOPS359 Monitor climatic conditions for renewable energy production

Modification History

Release 1. This is the first release of this unit of competency in the UEP Generation Training Package.

Performance Evidence

Evidence required to demonstrate competence in this unit must be relevant to and satisfy all the requirements of the elements, performance criteria and range of conditions on at least two separate occasions and includes:

- applying Work, Health and Safety (WHS)/Occupational Health and Safety (OHS) requirements including:
  - emergency procedures
  - risk control measures
  - safe working practices
- carrying out preventative actions
- communicating with stakeholders and key personnel
- completing documentation using recording procedures
- identifying renewable energy plant status
- implementing legislation, industry standards, codes of practice and regulations
- interpreting weather and climate conditions and possible impact on renewable energy plant, equipment and civil assets using data analysis techniques and tools
- monitoring weather and climate during adverse conditions
- organising resources
- preparing renewable energy plant and/or equipment for operation
- using manufacturers' specifications and manuals

Knowledge Evidence

Evidence required to demonstrate competence in this unit must be relevant to and satisfy all the requirements of the elements, performance criteria and range of conditions and includes knowledge of:

- climate and weather patterns in area
- legislation, industry standards, codes of practice and regulations
- manufacturers' specifications and manuals
- renewable energy plant and equipment, its location and operating parameters
- renewable energy plant status
- typical arrangements of renewable energy power production plant

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- weather and climate conditions and its possible impact on renewable energy plant, equipment and civil assets
- WHS/OHS legislated requirements including:
  - emergency procedures
  - risk control measures
  - safe working practices
- workplace documentation
- workplace policies and procedures

Assessment Conditions

As a minimum, assessors must satisfy applicable regulatory requirements, which include requirements in the Standards for Registered Training Organisations current at the time of assessment.

As a minimum, assessment must satisfy applicable regulatory requirements, which include requirements in the Standards for Registered Training Organisations current at the time of assessment.

Assessment processes and techniques must be appropriate to the language, literacy and numeracy requirements of the work being performed and the needs of the candidate.

Assessment must occur in workplace operational situations. Where this is not appropriate, assessment must occur in simulated workplace operational situations that reflect workplace conditions.

Resources for assessment must include access to:

- a range of relevant exercises, case studies and/or other simulations
- relevant and appropriate materials, tools, equipment and personal protective equipment currently used in industry
- applicable documentation including workplace procedures, industry standards, equipment specifications, regulations, codes of practice and operation manuals.

Links

Companion Volume implementation guides are found in VETNet - https://vetnet.gov.au/Pages/TrainingDocs.aspx?q=1715b9fa-e7bd-441c-bb8d-cf22c9c825a8

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UEPOPS360 Operate and monitor a hydro turbine

Modification History

Release 1. This is the first release of this unit of competency in the UEP Generation Training Package.

Application

This unit involves the skills and knowledge required to operate, inspect and monitor in-service hydro turbines. Turbines are a basic component in most methods of generating electricity in hydro generation power facilities.

Competency in this unit requires the ability to plan work, operate hydro turbine plant, test hydro turbine plant, analyse hydro turbine plant faults, monitor and inspect hydro turbine plant and the completion of all documentation. Individuals will, in general, work under supervision, in a power generation facility as an operator. Power generation plant operators are typically trained and authorised to isolate, prepare plant and issue permits to work.

No licensing, legislative or certification requirements apply to this unit at the time of publication.

Note: Workplace practice

The application of the skills and knowledge described in this unit may require a licence or training permit to practice in the workplace where work is carried out on gas and electrical installations. Additional conditions may apply under state and territory legislative and regulatory licensing requirements.

Pre-requisite Unit

There are no prerequisites.

Competency Field

Operations

Unit Sector

Electricity generation

Elements and Performance Criteria

ELEMENTS	PERFORMANCE CRITERIA
Elements describe the essential	Performance criteria describe the performance needed to

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outcomes.	demonstrate achievement of the element.
1 Plan and prepare work	**1.1** Safety issues related to operating and monitoring hydro turbine plant are identified, in accordance with workplace procedures and Work, Health and Safety (WHS)/Occupational Health and Safety (OHS) regulations and legislative requirements
	1.2 Work tasks and hydro turbine plant requirements are identified from appropriate personnel and documentation, in accordance with workplace procedures
	1.3 Hydro turbine run up and loading schedule are ascertained from relevant documentation, in accordance with workplace procedures and site requirements
	1.4 Inspection, preoperational tests and field preparations for hydro turbine plant service are carried out, in accordance with workplace procedures and manufacturers' recommendations
	1.5 Hydro turbine plant operational prerequisites are established, in accordance with workplace procedures and manufacturers' recommendations
	1.6 Sequence for recommissioning of hydro turbine plant is determined, in accordance with workplace procedures and site requirements
2 Operate hydro turbine plant	**2.1** Output is adjusted to achieve required hydro turbine operating conditions and demand, in accordance with workplace procedures and operational requirements
	2.2 Hydro turbine plant is operated within limits of its' design, in accordance with workplace procedures
	2.3 Hydro turbine plant is monitored and observed, in accordance with workplace procedures, to detect deviations from required operating conditions
	2.4 Corrective actions are taken to rectify hydro turbine abnormalities, in accordance with workplace procedures and manufacturers' recommendations
3 Test hydro turbine plant operation	**3.1** Operational tests are performed, in accordance with workplace procedures
	3.2 Hydro turbine plant is observed for correct operational

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		response, in accordance with workplace procedures
	3.3	Corrective action is taken, in accordance with workplace procedures, when response does not meet with documentation, hydro turbine plant integrity or personnel safety requirements
	3.4	Hydro turbine plant is returned to required safe operational status upon completion of testing, in accordance with workplace procedures
4 Analyse hydro turbine plant faults	**4.1**	Cause of abnormal hydro turbine plant operating conditions are identified, in accordance with workplace procedures, and by analysing technical and operational information
	4.2	Actions necessary to rectify faults are correctly determined, in accordance with workplace procedures
	4.3	Hydro turbine plant integrity and personnel safety is maintained, in accordance with workplace procedures, and in consultation with appropriate personnel and technical and operational documentation
5 Monitor and inspect hydro turbine plant	**5.1**	Hydro turbine plant to be monitored and inspected is physically identified, in accordance with workplace procedures
	5.2	Hydro turbine plant is monitored and inspected, in accordance with workplace procedures, for normal operation or to detect deviations
	5.3	Corrective action is taken, in accordance with workplace procedures
	5.4	Appropriate personnel are notified, in accordance with workplace procedures, when defects are detected
6 Complete documentation	**6.1**	Hydro turbine plant problems, movements, and status are reported, in accordance with workplace procedures
	6.2	Documentation is updated, in accordance with workplace procedures

Foundation Skills

Foundation skills essential to performance are explicit in the performance criteria of this unit of competency.

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Range of Conditions

Range is restricted to essential operating conditions and any other variables essential to the work environment.

Non-essential conditions may be found in the Companion Volume Implementation Guide.

Unit Mapping Information

This unit replaces and is equivalent to UEPOPS360A Operate and monitor a hydro turbine.

Links

Companion Volume implementation guides are found in VETNet - https://vetnet.gov.au/Pages/TrainingDocs.aspx?q=1715b9fa-e7bd-441c-bb8d-cf22c9c825a8

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Assessment Requirements for UEPOPS360 Operate and monitor a hydro turbine

Modification History

Release 1. This is the first release of this unit of competency in the UEP Generation Training Package.

Performance Evidence

Evidence required to demonstrate competence in this unit must be relevant to and satisfy all the requirements of the elements, performance criteria and range of conditions on at least two separate occasions and includes:

- analysing hydro turbine plant faults using data analysis techniques and tools
- applying Work, Health and Safety (WHS)/Occupational Health and Safety (OHS) requirements including:
  - emergency procedures
  - risk control measures
  - safe working practices
- communicating with personnel
- completing documentation using recording procedures
- coordinating remote operation of equipment to maintain hydro turbine plant integrity
- identifying hydro turbine plant status
- monitoring and inspecting hydro turbine plant operation
- operating hydro turbine unit and equipment under the influence of high water pressures or flows
- organising resources
- preparing and planning work
- recognising and responding to abnormal hydro turbine plant operating conditions
- testing hydro turbine plant operationally using diagnostic and testing techniques
- using permit to work system
- working with hydro turbine plant and equipment

Knowledge Evidence

Evidence required to demonstrate competence in this unit must be relevant to and satisfy all the requirements of the elements, performance criteria and range of conditions and includes knowledge of:

- hydro turbine plant and equipment, its location and operating parameters inclusive of the influence of high water pressure and/or flows
- hydro turbine plant status

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- legislation, industry standards, codes of practice and regulations
- manufacturers' specifications and manuals
- permit to work system
- typical arrangements of hydro power production plant
- WHS/OHS legislated requirements including:
  - emergency procedures
  - risk control measures
  - safe working practices
- workplace documentation
- workplace policies and procedures

Assessment Conditions

As a minimum, assessors must satisfy applicable regulatory requirements, which include requirements in the Standards for Registered Training Organisations current at the time of assessment.

As a minimum, assessment must satisfy applicable regulatory requirements, which include requirements in the Standards for Registered Training Organisations current at the time of assessment.

Assessment processes and techniques must be appropriate to the language, literacy and numeracy requirements of the work being performed and the needs of the candidate.

Assessment must occur in workplace operational situations. Where this is not appropriate, assessment must occur in simulated workplace operational situations that reflect workplace conditions.

Resources for assessment must include access to:

- a range of relevant exercises, case studies and/or other simulations
- relevant and appropriate materials, tools, equipment and personal protective equipment currently used in industry
- applicable documentation including workplace procedures, industry standards, equipment specifications, regulations, codes of practice and operation manuals.

Links

Companion Volume implementation guides are found in VETNet - https://vetnet.gov.au/Pages/TrainingDocs.aspx?q=1715b9fa-e7bd-441c-bb8d-cf22c9c825a8

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UEPOPS361 Operate and monitor hydro plant auxiliary systems

Modification History

Release 1. This is the first release of this unit of competency in the UEP Generation Training Package.

Application

This unit involves the skills and knowledge required to operate, inspect and monitor hydro plant auxiliary systems.

A variety of auxiliary plant systems and related controls are used in power generation facilities to support the operation of hydro generating units. Auxiliary plant systems may include ancillary equipment such as pumps, valves, screens and seals.

Competency in this unit requires the ability to plan work, operate hydro plant auxiliary system, test hydro plant auxiliary system, analyse hydro plant auxiliary faults, monitor and inspect hydro plant and the completion of all documentation. Individuals will, in general, work under supervision, in a power generation facility as an operator.

Power generation plant operators are typically trained and authorised to isolate, prepare plant and issue permits to work.

No licensing, legislative or certification requirements apply to this unit at the time of publication.

Note: Workplace practice

The application of the skills and knowledge described in this unit may require a licence or training permit to practice in the workplace where work is carried out on gas and electrical installations. Additional conditions may apply under state and territory legislative and regulatory licensing requirements.

Pre-requisite Unit

There are no prerequisite units.

Competency Field

Operations

Unit Sector

Electricity generation

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Elements and Performance Criteria

ELEMENTS	PERFORMANCE CRITERIA
Elements describe the essential outcomes.	Performance criteria describe the performance needed to demonstrate achievement of the element.
1 Plan and prepare work	**1.1** Safety issues related to operating and monitoring hydro plant auxiliary system are identified, in accordance with workplace procedures and Work, Health and Safety (WHS)/Occupational Health and Safety (OHS) regulations and legislative requirements
	1.2 Work tasks, hydro plant auxiliary system requirements are identified, in accordance with workplace procedures, from appropriate personnel and documentation
	1.3 Hydro plant auxiliary system running-up and loading schedule are ascertained, in accordance with workplace procedures, and from relevant documentation
	1.4 Inspection, preoperational tests and field preparation for hydro plant auxiliary system service are carried out, in accordance with workplace procedures and manufacturers' recommendations
	1.5 Hydro plant auxiliary system operational prerequisites are established, in accordance with workplace procedures and manufacturers' recommendations
	1.6 Sequence for recommissioning of hydro plant auxiliary system is determined, in accordance with workplace procedures and site requirements
2 Test hydro plant auxiliary system operation	**2.1** Hydro plant auxiliary system is operated, in accordance with workplace procedures and manufacturers' operating recommendations
	2.2 Operational tests are performed, in accordance with workplace procedures
	2.3 Hydro plant auxiliary system plant is observed, in accordance with workplace procedures, for correct operational response
	2.4 Corrective action is taken, in accordance with workplace procedures, when response does not meet with documentation, hydro plant auxiliary system integrity or personnel safety requirements

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	2.5	Hydro plant auxiliary system is returned to required operational status upon completion of testing, in accordance with workplace procedures
3 Analyse hydro plant auxiliary system faults	**3.1**	Cause of abnormal hydro plant auxiliary system operating conditions are identified, in accordance with workplace procedures, and by analysing technical and operational information
	3.2	Corrective actions to rectify faults are determined, in accordance with workplace procedures
	3.3	Hydro plant auxiliary system integrity and personnel safety is maintained, in accordance with workplace procedures, and in consultation with appropriate personnel and technical and operational documentation
4 Monitor and inspect hydro plant auxiliary system	**4.1**	Hydro plant auxiliary system to be monitored and inspected is physically identified, in accordance with workplace procedures
	4.2	Hydro plant auxiliary system is monitored and inspected, in accordance with workplace procedures, for normal operation or to detect deviations
	4.3	Appropriate personnel are notified when defects are detected, in accordance with workplace procedures
5 Complete documentation	**5.1**	Hydro plant auxiliary system problems, abnormalities and status are reported, in accordance with workplace procedures
	5.2	Documentation is updated, in accordance with workplace procedures

Foundation Skills

Foundation skills essential to performance are explicit in the performance criteria of this unit of competency.

Range of Conditions

Range is restricted to essential operating conditions and any other variables essential to the work environment.

Non-essential conditions may be found in the Companion Volume Implementation Guide.

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Unit Mapping Information

This unit replaces and is equivalent to UEPOPS361A Operate and monitor hydro plant auxiliary systems.

Links

Companion Volume implementation guides are found in VETNet - https://vetnet.gov.au/Pages/TrainingDocs.aspx?q=1715b9fa-e7bd-441c-bb8d-cf22c9c825a8

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Assessment Requirements for UEPOPS361 Operate and monitor hydro plant auxiliary systems

Modification History

Release 1. This is the first release of this unit of competency in the UEP Generation Training Package.

Performance Evidence

Evidence required to demonstrate competence in this unit must be relevant to and satisfy all the requirements of the elements, performance criteria and range of conditions on at least two separate occasions and includes:

- analysing hydro plant auxiliary system faults using data analysis techniques and tools
- applying Work, Health and Safety (WHS)/Occupational Health and Safety (OHS) requirements including:
  - emergency procedures
  - risk control measures
  - safe working practices
- communicating with personnel
- completing documentation using recording procedures
- identifying hydro plant auxiliary system status
- monitoring and inspecting hydro plant auxiliary system operations
- operating hydro plant auxiliary system and equipment including when under the influence of high water pressures and or flows
- organising resources
- preparing and planning work
- recognising and responding to abnormal hydro plant auxiliary system operating conditions
- testing hydro plant auxiliary system operationally using diagnostic and test techniques
- using permit to work system
- working with hydro plant auxiliary system and/or equipment

Knowledge Evidence

Evidence required to demonstrate competence in this unit must be relevant to and satisfy all the requirements of the elements, performance criteria and range of conditions and includes knowledge of:

- hydro plant auxiliary system and equipment, its location and operating parameters
- hydro plant auxiliary system including equipment behaviours under the influence of high water pressure and/or flows
- legislation, industry standards, codes of practice and regulations

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- manufacturers' specifications and manuals
- permit to work system
- typical arrangements of power production plant including hydro generator types and characteristics
- WHS/OHS legislated requirements including:
  - emergency procedures
  - risk control measures
  - safe working procedures
- workplace documentation
- workplace policies and procedures

Assessment Conditions

As a minimum, assessors must satisfy applicable regulatory requirements, which include requirements in the Standards for Registered Training Organisations current at the time of assessment.

As a minimum, assessment must satisfy applicable regulatory requirements, which include requirements in the Standards for Registered Training Organisations current at the time of assessment.

Assessment processes and techniques must be appropriate to the language, literacy and numeracy requirements of the work being performed and the needs of the candidate.

Assessment must occur in workplace operational situations. Where this is not appropriate, assessment must occur in simulated workplace operational situations that reflect workplace conditions.

Resources for assessment must include access to:

- a range of relevant exercises, case studies and/or other simulations
- relevant and appropriate materials, tools, equipment and personal protective equipment currently used in industry
- applicable documentation including workplace procedures, industry standards, equipment specifications, regulations, codes of practice and operation manuals.

Links

Companion Volume implementation guides are found in VETNet - https://vetnet.gov.au/Pages/TrainingDocs.aspx?q=1715b9fa-e7bd-441c-bb8d-cf22c9c825a8

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UEPOPS362 Operate and monitor generator/alternator

Modification History

Release 1. This is the first release of this unit of competency in the UEP Generation Training Package.

Application

This unit involves the skills and knowledge required to operate, inspect and monitor a generator and/or alternator.

An alternator is an electrical generator that converts mechanical energy to electrical energy in the form of an Alternating Current (AC). In contrast, a generator can produce either Alternating Current (AC) or Direct Current (DC).

Competency in this unit requires the ability to plan work, operate generator and/or alternator plant, test generator and/or alternator plant, analyse generator and/or alternator plant faults, monitor and inspect generator and/or alternator plant and the completion of all documentation. Individuals will, in general, work under supervision, in a power generation facility as an operator.

Power generation plant operators are typically trained and authorised to isolate, prepare plant and issue permits to work.

No licensing, legislative or certification requirements apply to this unit at the time of publication.

Note: Workplace practice

The application of the skills and knowledge described in this unit may require a licence or training permit to practice in the workplace where work is carried out on gas and electrical installations. Additional conditions may apply under state and territory legislative and regulatory licensing requirements.

Pre-requisite Unit

There are no prerequisite units.

Competency Field

Operations

Unit Sector

Electricity generation

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Elements and Performance Criteria

ELEMENTS	PERFORMANCE CRITERIA
Elements describe the essential outcomes.	Performance criteria describe the performance needed to demonstrate achievement of the element.
1 Plan and prepare work	**1.1** Safety issues related to operating and monitoring generator and/or alternator plant are identified, in accordance with workplace procedures and Work, Health and Safety (WHS)/Occupational Health and Safety(OHS) regulations and legislative requirements
	1.2 Work and generator and/or alternator plant are identified from appropriate personnel and documentation, in accordance with workplace procedures
	1.3 Generator and/or alternator running up and loading schedule are ascertained from relevant documentation, in accordance with workplace procedures and site requirements
	1.4 Inspection, preoperational tests and field preparations for generator and/or alternator plant service are carried out, in accordance with workplace procedures and manufacturers' recommendations
	1.5 Generator and/or alternator plant operational prerequisites are established, in accordance with workplace procedures and manufacturers' recommendations
	1.6 Sequence for recommissioning of generator and/or alternator plant is determined to suit existing circumstances, in accordance with workplace procedures and site requirements
2 Operate generator/alternator plant	**2.1** Output is adjusted to achieve required generator and/or alternator operating requirements and demand, in accordance with workplace procedures
	2.2 Generator and/or alternator plant is operated within limits of its' design and regulators' requirements, in accordance with workplace procedures
	2.3 Generator and/or alternator plant is monitored and observed, in accordance with workplace procedures, to detect deviations from required operating conditions

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	2.4	Corrective actions are taken to rectify generator and/or alternator abnormalities, in accordance with workplace procedures and manufacturers' recommendations
3 Test generator/alternator plant operation	**3.1**	Operational tests are performed, in accordance with workplace procedures
	3.2	Generator and/or alternator plant is observed for correct operational response, in accordance with workplace procedures
	3.3	Corrective action is taken, in accordance with workplace procedures, when response does not meet with documentation, generator and/or alternator plant integrity or personnel safety requirements
	3.4	Generator and/or alternator plant is returned to required operational status upon completion of testing, in accordance with workplace procedures
4 Analyse generator/alternator plant faults	**4.1**	Cause of abnormal generator and/or alternator plant operating conditions are identified, in accordance with workplace procedures, by analysing technical and operational information
	4.2	Corrective actions to rectify generator and/or alternator faults are determined, in accordance with workplace procedures
	4.3	Generator and/or alternator plant integrity and personnel safety is maintained, in accordance with workplace procedures, and in consultation with appropriate personnel and technical and operational documentation
5 Monitor and inspect generator/alternator plant	**5.1**	Generator and/or alternator plant to be monitored and inspected is physically identified, in accordance with workplace procedures
	5.2	Generator and/or alternator plant is monitored and inspected, in accordance with workplace procedures, for normal operation or to detect deviations
	5.3	Corrective action is taken, in accordance with workplace procedures
	5.4	Appropriate personnel are notified when defects are detected, in accordance with workplace procedures
6 Complete documentation	**6.1**	Generator and/or alternator plant movements,

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abnormalities and status are reported, in accordance with workplace procedures

6.2 Documentation is updated, in accordance with workplace procedures

Foundation Skills

Foundation skills essential to performance are explicit in the performance criteria of this unit of competency.

Range of Conditions

Range is restricted to essential operating conditions and any other variables essential to the work environment.

Non-essential conditions may be found in the Companion Volume Implementation Guide.

Unit Mapping Information

This unit replaces and is equivalent to UEPOPS362A Operate and monitor generator/alternator.

Links

Companion Volume implementation guides are found in VETNet - https://vetnet.gov.au/Pages/TrainingDocs.aspx?q=1715b9fa-e7bd-441c-bb8d-cf22c9c825a8

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Assessment Requirements for UEPOPS362 Operate and monitor generator/alternator

Modification History

Release 1. This is the first release of this unit of competency in the UEP Generation Training Package.

Performance Evidence

Evidence required to demonstrate competence in this unit must be relevant to and satisfy all the requirements of the elements, performance criteria and range of conditions on at least two separate occasions and includes:

- analysing generator and/or alternator plant faults using data analysis techniques and tools
- applying Work, Health and Safety (WHS)/Occupational Health and Safety (OHS) requirements including:
  - emergency procedures
  - risk control measures
  - safe working practices
- communicating with personnel
- completing documentation using recording procedures
- identifying generator and/or alternator plant status
- interpreting manufacturers' specifications and manuals
- monitoring and inspecting generator and/or alternator plant operations including adjusting generator and/or alternator voltage, frequency and power factors and site target values
- operating a generator and/or alternator unit
- organising resources
- preparing and planning work
- recognising and responding to abnormal generator and/or alternator plant operating conditions
- testing generator and/or alternator plant operationally using diagnostic and test techniques
- working with generator and/or alternator plant and/or equipment
- working with permit to work system

Knowledge Evidence

Evidence required to demonstrate competence in this unit must be relevant to and satisfy all the requirements of the elements, performance criteria and range of conditions and includes knowledge of:

- abnormal generator and/or alternator behaviour
- generator and/or alternator plant and equipment, its location and operating parameters

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including types and characteristics
- generator and/or alternator voltage, frequency and power factors and site target values
- legislation, industry standards, codes of practice and regulations
- manufacturers' specifications and manuals
- permit to work system
- WHS/OHS legislated requirements including:
  - emergency procedures
  - risk control measures
  - safe working practices
- workplace documentation
- workplace policies and procedures

Assessment Conditions

As a minimum, assessors must satisfy applicable regulatory requirements, which include requirements in the Standards for Registered Training Organisations current at the time of assessment.

As a minimum, assessment must satisfy applicable regulatory requirements, which include requirements in the Standards for Registered Training Organisations current at the time of assessment.

Assessment processes and techniques must be appropriate to the language, literacy and numeracy requirements of the work being performed and the needs of the candidate.

Assessment must occur in workplace operational situations. Where this is not appropriate, assessment must occur in simulated workplace operational situations that reflect workplace conditions.

Resources for assessment must include access to:

- a range of relevant exercises, case studies and/or other simulations
- relevant and appropriate materials, tools, equipment and personal protective equipment currently used in industry
- applicable documentation including workplace procedures, industry standards, equipment specifications, regulations, codes of practice and operation manuals.

Links

Companion Volume implementation guides are found in VETNet - https://vetnet.gov.au/Pages/TrainingDocs.aspx?q=1715b9fa-e7bd-441c-bb8d-cf22c9c825a8

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UEPOPS364 Ensure compliance with Work, Health and Safety policy and procedures

Modification History

Release 1. This is the first release of this unit of competency in the UEP Generation Training Package.

Application

This unit involves the skills and knowledge required to ensure Work, Health and Safety (WHS)/Occupational Health and Safety (OHS) policies and procedures are followed, in order to ensure safety in the workplace.

WHS/OHS is concerned with protecting the health and safety of all stakeholders in the workplace from exposure to hazards and risks resulting from work activities. It involves the application of WHS/OHS legislation and codes of practice, meeting regulatory obligations, identifying risks, determining strategies for control of risks and responding quickly to incidents.

Competency in this unit requires the ability to identify WHS/OHS policies and procedures, contribute to WHS/OHS in the workplace, confirm WHS/OHS compliance and maintain WHS/OHS records. Individuals will, in general, work as an operator in a power generation facility.

No licensing, legislative or certification requirements apply to this unit at the time of publication.

Note: Workplace practice

The application of the skills and knowledge described in this unit may require a licence or training permit to practice in the workplace where work is carried out on gas and electrical installations. Additional conditions may apply under state and territory legislative and regulatory licensing requirements.

Pre-requisite Unit

There are no perquisite units.

Competency Field

Operations

Unit Sector

Electricity generation

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Elements and Performance Criteria

ELEMENTS	PERFORMANCE CRITERIA
Elements describe the essential outcomes.	Performance criteria describe the performance needed to demonstrate achievement of the element.
1 Identify WHS policies and procedures	**1.1** Work, Health and Safety (WHS)/Occupational Health and Safety (OHS) legislation, including duty of care, and codes of practice are identified and explained to personnel and stakeholders, in accordance with workplace procedures
	1.2 WHS/OHS procedures for dealing with accidents, fires and emergencies are maintained and updated, in accordance with workplace procedures
	1.3 Information about identified hazards and the outcome of risk assessments and risk control procedures are provided to personnel and stakeholders, in accordance with workplace procedures
2 Contribute to WHS in the workplace	**2.1** Hazards are identified and reported to designated personnel, in accordance with workplace procedures
	2.2 WHS/OHS issues raised with designated personnel are confirmed, in accordance with workplace procedures and WHS/OHS legislation requirements
3 Confirm WHS compliance	**3.1** Risk control compliance is monitored, in accordance with workplace procedures
	3.2 Inadequacies in existing risk control measures are identified and reported, in accordance with workplace procedures and hierarchy of control
	3.3 Inadequacies in resource allocation for implementation of risk control measures are identified and reported to designated personnel, in accordance with workplace procedures
	3.4 Work is stopped and safety discussion is conducted where noncompliance is observed
4 Maintain WHS records	**4.1** WHS/OHS records are completed, in accordance with workplace procedures
	4.2 WHS/OHS records are monitored for compliance, in accordance with workplace procedures

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Foundation Skills

Foundation skills essential to performance are explicit in the performance criteria of this unit of competency.

Range of Conditions

Range is restricted to essential operating conditions and any other variables essential to the work environment.

Non-essential conditions may be found in the Companion Volume Implementation Guide.

Unit Mapping Information

This unit replaces and is equivalent to UEPOPS364A Ensure compliance with Work, Health and Safety policy and procedures.

Links

Companion Volume implementation guides are found in VETNet - https://vetnet.gov.au/Pages/TrainingDocs.aspx?q=1715b9fa-e7bd-441c-bb8d-cf22c9c825a8

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Assessment Requirements for UEPOPS364 Ensure compliance with Work, Health and Safety policy and procedures

Modification History

Release 1. This is the first release of this unit of competency in the UEP Generation Training Package.

Performance Evidence

Evidence required to demonstrate competence in this unit must be relevant to and satisfy all the requirements of the elements, performance criteria and range of conditions on at least two separate occasions and includes:

- applying Work, Health and Safety (WHS)/Occupational Health and Safety (OHS) requirements including:
  - controlling risks
  - emergency procedures and techniques
  - recognising potential hazards
  - safe working practices
- communicating effectively with personnel and stakeholders
- confirming WHS/OHS compliance
- contributing to WHS/OHS in the workplace
- identifying WHS/OHS policies and procedures
- maintaining WHS/OHS records
- reporting of WHS/OHS issues

Knowledge Evidence

Evidence required to demonstrate competence in this unit must be relevant to and satisfy all the requirements of the elements, performance criteria and range of conditions and includes knowledge of:

- communication of WHS/OHS requirements
- report obligations for WHS/OHS issues
- WHS/OHS legislated requirements including:
  - recognising potential hazards
  - controlling of risks
  - emergency procedures and techniques
  - safe working practices
- workplace documentation
- workplace policies and procedures

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Assessment Conditions

As a minimum, assessors must satisfy applicable regulatory requirements, which include requirements in the Standards for Registered Training Organisations current at the time of assessment.

As a minimum, assessment must satisfy applicable regulatory requirements, which include requirements in the Standards for Registered Training Organisations current at the time of assessment.

Assessment processes and techniques must be appropriate to the language, literacy and numeracy requirements of the work being performed and the needs of the candidate.

Assessment must occur in workplace operational situations. Where this is not appropriate, assessment must occur in simulated workplace operational situations that reflect workplace conditions.

Resources for assessment must include access to:

- a range of relevant exercises, case studies and/or other simulations
- relevant and appropriate materials, tools, equipment and personal protective equipment currently used in industry
- applicable documentation including workplace procedures, industry standards, equipment specifications, regulations, codes of practice and operation manuals.

Links

Companion Volume implementation guides are found in VETNet - https://vetnet.gov.au/Pages/TrainingDocs.aspx?q=1715b9fa-e7bd-441c-bb8d-cf22c9c825a8

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UEPOPS368 Operate manual systems

Modification History

Release 1. This is the first release of this unit of competency in the UEP Generation Training Package.

Application

This unit involves the skills and knowledge required to operate power generation plant in manual mode, in conjunction with coordinated systems, under the control of appropriate authorised personnel.

Power generation plant may be manually controlled by an operator rather than automatically by a computer when required by circumstances.

Competency in this unit requires the ability to plan and prepare work, operate plant and equipment manually and complete documentation. Individuals will, in general, work under supervision, as an operator in a power generation facility.

Power generation plant operators are typically trained and authorised to isolate, prepare plant and issue permits to work.

No licensing, legislative or certification requirements apply to this unit at the time of publication.

Note: Workplace practice

The application of the skills and knowledge described in this unit may require a licence or training permit to practice in the workplace where work is carried out on gas and electrical installations. Additional conditions may apply under state and territory legislative and regulatory licensing requirements.

Pre-requisite Unit

UEPOPS252 Undertake local systems operations

Competency Field

Operations

Unit Sector

Electricity generation

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Elements and Performance Criteria

ELEMENTS	PERFORMANCE CRITERIA
Elements describe the essential outcomes.	Performance criteria describe the performance needed to demonstrate achievement of the element.
1 Plan and prepare work	**1.1** Safety issues are identified, in accordance with Work, Health and Safety (WHS)/Occupational Health and Safety (OHS) regulations, legislative requirements, industry standards and workplace procedures
	1.2 Work requirements are identified from relevant personnel and documentation, in accordance with workplace procedures
	1.3 Power generation plant status is identified and confirmed, in accordance with workplace procedures, site requirements and documentation
	1.4 Preoperational checks are carried out on power generation plant, in accordance with manufacturers' recommendations and workplace procedures
2 Conduct manual operation of plant	**2.1** Power generation plant to be manually controlled is identified and operated, in accordance with workplace operating procedures
	2.2 Power generation plant is manually operated within limits of its' design, in accordance with workplace procedures
	2.3 Power generation plant is monitored to detect deviations from normal operating conditions, in accordance with workplace procedures
	2.4 Corrective actions are taken to rectify power generation plant abnormalities, in accordance with manufacturers' recommendations and workplace procedures
3 Complete documentation	**3.1** Power generation plant problems, movements, and status are reported in accordance with workplace procedures
	3.2 Documentation is updated, in accordance with workplace procedures

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Foundation Skills

Foundation skills essential to performance are explicit in the performance criteria of this unit of competency.

Range of Conditions

Range is restricted to essential operating conditions and any other variables essential to the work environment.

Non-essential conditions may be found in the Companion Volume Implementation Guide.

Unit Mapping Information

This unit replaces and is equivalent to UEPOPS368A Operate manual systems

Links

Companion Volume implementation guides are found in VETNet - https://vetnet.gov.au/Pages/TrainingDocs.aspx?q=1715b9fa-e7bd-441c-bb8d-cf22c9c825a8

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Assessment Requirements for UEPOPS368 Operate manual systems

Modification History

Release 1. This is the first release of this unit of competency in the UEP Generation Training Package.

Performance Evidence

Evidence required to demonstrate competence in this unit must be relevant to and satisfy all the requirements of the elements, performance criteria and range of conditions on at least two separate occasions and includes:

- applying Work, Health and Safety (WHS)/Occupational Health and Safety (OHS) regulations including:
  - emergency procedures
  - risk control measures
  - safe working practices
- communicating with personnel
- completing documentation using recording procedures
- identifying operation of power generation plant and equipment
- implementing legislation, industry standards, codes of practices and regulations
- interpreting manufacturers' specifications and manuals
- operating manual systems in a power generation facility
- planning manual operation of power generation plant
- recognising power generation plant status

Knowledge Evidence

Evidence required to demonstrate competence in this unit must be relevant to and satisfy all the requirements of the elements, performance criteria and range of conditions and includes knowledge of:

- legislation, industry standards, codes of practices and regulations
- manual operation of power generation systems
- manufacturers' specifications and manuals
- power generation plant and equipment, its location and operating parameters
- typical arrangements of power generation plant
- WHS/OHS legislated requirements including:
  - emergency procedures
  - risk control measures

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  - safe working practices
- workplace documentation
- workplace policies and procedures

Assessment Conditions

As a minimum, assessors must satisfy applicable regulatory requirements, which include requirements in the Standards for Registered Training Organisations current at the time of assessment.

As a minimum, assessment must satisfy applicable regulatory requirements, which include requirements in the Standards for Registered Training Organisations current at the time of assessment.

Assessment processes and techniques must be appropriate to the language, literacy and numeracy requirements of the work being performed and the needs of the candidate.

Assessment must occur in workplace operational situations. Where this is not appropriate, assessment must occur in simulated workplace operational situations that reflect workplace conditions.

Resources for assessment must include access to:

- a range of relevant exercises, case studies and/or other simulations
- relevant and appropriate materials, tools, equipment and personal protective equipment currently used in industry
- applicable documentation including workplace procedures, industry standards, equipment specifications, regulations, codes of practice and operation manuals.

Links

Companion Volume implementation guides are found in VETNet - https://vetnet.gov.au/Pages/TrainingDocs.aspx?q=1715b9fa-e7bd-441c-bb8d-cf22c9c825a8

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UEPOPS369 Respond to a critical incident

Modification History

Release 1. This is the first release of this unit of competency in the UEP Generation Training Package.

Application

This unit involves the skills and knowledge required to respond to a critical incident that may impact the operational effectiveness of a power generation facility's plant or system, endanger human life, damage or destroy property and/or have an adverse impact on the environment.

A critical incident refers to a crisis that may result in a high level of risk, directly or indirectly, to the core operations of a power generation facility. A high level of risk would be determined using the risk management processes outlined in the power generation facility's Risk Management System.

Competency in this unit requires the ability to identify a critical incident and consequences, stabilise power generation system, restore power generation system and review response to incident. Individuals will, in general, work as an operator, in a power generation facility.

Power generation plant operators are typically trained and authorised to isolate, prepare plant and issue permits to work.

No licensing, legislative or certification requirements apply to this unit at the time of publication.

Note: Workplace practice

The application of the skills and knowledge described in this unit may require a licence or training permit to practice in the workplace where work is carried out on gas and electrical installations. Additional conditions may apply under state and territory legislative and regulatory licensing requirements.

Pre-requisite Unit

There are no prerequisite units.

Competency Field

Operations

Unit Sector

Electricity generation

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Elements and Performance Criteria

ELEMENTS	PERFORMANCE CRITERIA
Elements describe the essential outcomes.	Performance criteria describe the performance needed to demonstrate achievement of the element.
1 Identify critical incident and consequences	**1.1** Information and documentation to determine power generation system status, and consequences of critical incident is analysed, in accordance with workplace procedures, legislative requirements, industry standards and Work, Health and Safety (WHS)/Occupational Health and Safety (OHS) regulations
	1.2 Fault location is determined by monitoring and evaluating power generation system configuration and operational prerequisites, in accordance with workplace procedures
	1.3 Fault information is collated, in accordance with workplace procedures, to determine type and cause of failure
	1.4 Power generation system limitations and performance, including location and any external influences, are identified, in accordance with workplace procedures
2 Stabilise power generation system	**2.1** Appropriate critical incident response techniques are identified and used, in accordance with workplace procedures
	2.2 Appropriate personnel and external stakeholders are consulted, in accordance with workplace procedures, prior to further critical incident actions being undertaken
	2.3 Power generation system requirements are assessed, and controlled, to maintain stability and integrity, in accordance with workplace procedures
	2.4 Corrective actions to rectify power generation system abnormalities are implemented, following analysis of data, in accordance with workplace procedures
3 Restore power generation system	**3.1** Specialised assistance, if required, is identified, in accordance with workplace procedures
	3.2 Strategies to restore power generation system integrity are identified, and communicated to appropriate personnel, in accordance with workplace procedures

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	3.3 Power generation system restoration is undertaken, and is monitored and adjusted, in accordance with workplace procedures
4 Review response to incident	**4.1** Power generation system response is analysed, in accordance with workplace procedures
	4.2 Critical incident preventive measures are documented, in accordance with workplace procedures
	4.3 Findings are communicated to appropriate personnel and key stakeholders, in accordance with workplace procedures

Foundation Skills

Foundation skills essential to performance are explicit in the performance criteria of this unit of competency.

Range of Conditions

Range is restricted to essential operating conditions and any other variables essential to the work environment.

Non-essential conditions may be found in the Companion Volume Implementation Guide.

Unit Mapping Information

This unit replaces and is equivalent to UEPOPS369A Respond to a critical incident.

Links

Companion Volume implementation guides are found in VETNet - https://vetnet.gov.au/Pages/TrainingDocs.aspx?q=1715b9fa-e7bd-441c-bb8d-cf22c9c825a8

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Assessment Requirements for UEPOPS369 Respond to a critical incident

Modification History

Release 1. This is the first release of this unit of competency in the UEP Generation Training Package.

Performance Evidence

Evidence required to demonstrate competence in this unit must be relevant to and satisfy all the requirements of the elements, performance criteria and range of conditions on at least two separate occasions and includes:

- applying Work, Health and Safety (WHS)/Occupational Health and Safety (OHS) requirements including:
  - emergency procedures
  - risk control measures
  - safe working practices
- communicating with personnel and stakeholders
- identifying and responding to abnormal power generation system operating conditions using data analysis techniques and tools
- identifying critical incident and consequences
- implementing legislation, industry standards, codes of practice and regulations
- interpreting manufacturers' specifications and manuals
- recognising power generation plant or system status using diagnostic techniques
- restoring power generation system
- reviewing response to incident
- stabilising and restoring power generation system operations
- stabilising power generation system
- using manufacturers' specifications and manuals

Knowledge Evidence

Evidence required to demonstrate competence in this unit must be relevant to and satisfy all the requirements of the elements, performance criteria and range of conditions and includes knowledge of:

- abnormal power generation system operating conditions
- generation and/or transmission capability limits
- legislation, industry standards, codes of practice and regulations
- manufacturers' specifications and manuals
- power generation plant and equipment, its location and operating parameters

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- power generation plant status
- power generation system restoration operations
- power generation system stabilisation
- typical arrangements of power production plant
- WHS/OHS legislated requirements including:
  - emergency procedures
  - risk control measures
  - safe working practices
- workplace documentation
- workplace policies and procedures

Assessment Conditions

As a minimum, assessors must satisfy applicable regulatory requirements, which include requirements in the Standards for Registered Training Organisations current at the time of assessment.

As a minimum, assessment must satisfy applicable regulatory requirements, which include requirements in the Standards for Registered Training Organisations current at the time of assessment.

Assessment processes and techniques must be appropriate to the language, literacy and numeracy requirements of the work being performed and the needs of the candidate.

Assessment must occur in workplace operational situations. Where this is not appropriate, assessment must occur in simulated workplace operational situations that reflect workplace conditions.

Resources for assessment must include access to:

- a range of relevant exercises, case studies and/or other simulations
- relevant and appropriate materials, tools, equipment and personal protective equipment currently used in industry
- applicable documentation including workplace procedures, industry standards, equipment specifications, regulations, codes of practice and operation manuals.

Links

Companion Volume implementation guides are found in VETNet - https://vetnet.gov.au/Pages/TrainingDocs.aspx?q=1715b9fa-e7bd-441c-bb8d-cf22c9c825a8

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UEPOPS370 Facilitate the use of contingency plans for power generation facilities

Modification History

Release 1. This is the first release of this unit of competency in the UEP Generation Training Package.

Application

This unit involves the skills and knowledge required to facilitate the use of contingency plans that are developed to support the integrity of power generation facilities.

A contingency plan is a course of action designed by a power generation facility to respond to potentially disruptive situations.

Competency in this unit requires the ability to identify contingencies, identify preferred contingency plans and complete all documentation. Individuals will, in general, work as an operator with responsibility for contingency planning or risk management, in a power generation facility.

Power generation plant operators are typically trained and authorised to isolate, prepare plant and issue permits to work.

No licensing, legislative or certification requirements apply to this unit at the time of publication.

Note: Workplace practice

The application of the skills and knowledge described in this unit may require a licence or training permit to practice in the workplace where work is carried out on gas and electrical installations. Additional conditions may apply under state and territory legislative and regulatory licensing requirements.

Pre-requisite Unit

There are no prerequisite units.

Competency Field

Operations

Unit Sector

Electricity generation

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Elements and Performance Criteria

ELEMENTS	PERFORMANCE CRITERIA
Elements describe the essential outcomes.	Performance criteria describe the performance needed to demonstrate achievement of the element.
1 Identify contingencies	**1.1** Potential contingencies are identified, in accordance with legislative requirements and industry standards from a risk assessment of functions which are critical to the performance of the power generation facility
	1.2 Likelihood and impact of risks is assessed and evaluated, in accordance with workplace procedures and the risk management system, and is also discussed with appropriate personnel and stakeholders
2 Identify contingency plan processes	**2.1** Contingency plan processes are identified and applied, in accordance with workplace procedures
	2.2 Roles and responsibilities for the contingency plan are identified, in accordance with workplace procedures
3 Complete documentation	**3.1** Power generating plant problems, movements and status are reported, in accordance with workplace procedures and contingency plan
	3.2 Documentation is updated, in accordance with workplace procedures

Foundation Skills

Foundation skills essential to performance are explicit in the performance criteria of this unit of competency.

Range of Conditions

Range is restricted to essential operating conditions and any other variables essential to the work environment.

Non-essential conditions may be found in the Companion Volume Implementation Guide.

Unit Mapping Information

This unit replaces and is equivalent to UEPOPS370A Facilitate the use of contingency plans.

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Companion Volume implementation guides are found in VETNet - https://vetnet.gov.au/Pages/TrainingDocs.aspx?q=1715b9fa-e7bd-441c-bb8d-cf22c9c825a8

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Assessment Requirements for UEPOPS370 Facilitate the use of contingency plans for power generation facilities

Modification History

Release 1. This is the first release of this unit of competency in the UEP Generation Training Package.

Performance Evidence

Evidence required to demonstrate competence in this unit must be relevant to and satisfy all the requirements of the elements, performance criteria and range of conditions on at least two separate occasions and includes:

- applying Work, Health and Safety (WHS)/Occupational Health and Safety (OHS) requirements including:
  - emergency procedures
  - risk control measures
  - safe working practices
- communicating with personnel and stakeholders
- completing documentation
- identifying potential contingencies to support the integrity of power generation facilities
- implementing legislation, industry standards, codes of practice and regulations
- recognising and using contingency plan processes

Knowledge Evidence

Evidence required to demonstrate competence in this unit must be relevant to and satisfy all the requirements of the elements, performance criteria and range of conditions and includes knowledge of:

- application of contingency plans
- identification of contingency plan processes
- legislation, industry standards, codes of practice and regulations
- power generating plant and equipment, its location and operating parameters
- typical arrangements of power production plant
- WHS/OHS legislated requirements including:
  - emergency procedures
  - risk control measures
  - safe working practices
- workplace documentation
- workplace policies and procedures

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Assessment Conditions

As a minimum, assessors must satisfy applicable regulatory requirements, which include requirements in the Standards for Registered Training Organisations current at the time of assessment.

As a minimum, assessment must satisfy applicable regulatory requirements, which include requirements in the Standards for Registered Training Organisations current at the time of assessment.

Assessment processes and techniques must be appropriate to the language, literacy and numeracy requirements of the work being performed and the needs of the candidate.

Assessment must occur in workplace operational situations. Where this is not appropriate, assessment must occur in simulated workplace operational situations that reflect workplace conditions.

Resources for assessment must include access to:

- a range of relevant exercises, case studies and/or other simulations
- relevant and appropriate materials, tools, equipment and personal protective equipment currently used in industry
- applicable documentation including workplace procedures, industry standards, equipment specifications, regulations, codes of practice and operation manuals.

Links

Companion Volume implementation guides are found in VETNet - https://vetnet.gov.au/Pages/TrainingDocs.aspx?q=1715b9fa-e7bd-441c-bb8d-cf22c9c825a8

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UEPOPS371 Carry out operational checks on in-service electrical plant

Modification History

Release 1. This is the first release of this unit of competency in the UEP Generation Training Package.

Application

This unit involves the skills and knowledge required to conduct operational checks on in-service electrical plant.

Operational maintenance checks need to be undertaken regularly to ensure the smooth and efficient operation of all in-service electrical plant in the power generation facility.

Competency in this unit requires the ability to plan, carry out in-service electrical checks on electrical plant and completion of work. Individuals will, in general, work under supervision, in a power generation facility as an operator.

Power generation plant operators are typically trained and authorised to isolate, prepare plant and issue permits to work.

No licensing, legislative or certification requirements apply to this unit at the time of publication.

Note: Workplace practice

The application of the skills and knowledge described in this unit may require a licence or training permit to practice in the workplace where work is carried out on gas and electrical installations. Additional conditions may apply under state and territory legislative and regulatory licensing requirements.

Pre-requisite Unit

There are no prerequisite units.

Competency Field

Operations

Unit Sector

Electricity generation

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Elements and Performance Criteria

ELEMENTS	PERFORMANCE CRITERIA
Elements describe the essential outcomes.	Performance criteria describe the performance needed to demonstrate achievement of the element.
1 Plan for electrical plant in-service checks	**1.1** Safety issues are identified, in accordance with Work, Health and Safety (WHS)/Occupational Health and Safety (OHS) legislative requirements, industry standards and workplace procedures
	1.2 Work, electrical plant and resource requirements are identified from relevant work orders and documentation, in accordance with workplace procedures
	1.3 Electrical plant status and work requirements are confirmed with appropriate personnel or by site inspection, in accordance with workplace procedures
	1.4 Equipment is checked for correct calibration and operation in accordance with workplace procedures
	1.5 Correct size, type and quantity of materials and components are obtained and inspected for compliance with job specification, in accordance with workplace procedures
	1.6 Potential hazards are identified and risk control measures are implemented in accordance with the workplace procedures,
	1.7 Pre-access checks are carried out, in accordance with workplace procedures
2 Carry out in-service electrical checks	**2.1** Electrical plant is operated, in accordance with workplace procedures and manufacturers' recommendations
	2.2 Electrical plant checks are monitored, in accordance with workplace procedures, to detect deviations from normal operation
	2.3 Electrical plant integrity and personnel safety are maintained, in accordance with workplace procedures, and through consultation with appropriate personnel and technical and operational documentation
3 Complete work	**3.1** Electrical plant control measures are returned to required operational status on completion of checks, in

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accordance with workplace procedures

3.2 Appropriate personnel are notified of completion of work, in accordance with workplace procedures

3.3 Electrical plant problems or abnormalities are reported in accordance with workplace procedures

3.4 Operational check results are documented, in accordance with workplace procedures

Foundation Skills

Foundation skills essential to performance are explicit in the performance criteria of this unit of competency.

Range of Conditions

Range is restricted to essential operating conditions and any other variables essential to the work environment.

Non-essential conditions may be found in the Companion Volume Implementation Guide.

Unit Mapping Information

This unit replaces and is equivalent to UEPOPS371A Carry out operational checks on in-service electrical plant.

Links

Companion Volume implementation guides are found in VETNet - https://vetnet.gov.au/Pages/TrainingDocs.aspx?q=1715b9fa-e7bd-441c-bb8d-cf22c9c825a8

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Assessment Requirements for UEPOPS371 Carry out operational checks on in-service electrical plant

Modification History

Release 1. This is the first release of this unit of competency in the UEP Generation Training Package.

Performance Evidence

Evidence required to demonstrate competence in this unit must be relevant to and satisfy all the requirements of the elements, performance criteria and range of conditions on at least two separate occasions and includes:

- applying Work, Health and Safety (WHS)/Occupational Health and Safety (OHS) legislated requirements including:
  - emergency procedures
  - risk control measures
  - safe working practices
- carrying out operational checks on in-service electrical plant
- communicating with personnel
- completing documentation and reporting on electrical plant using recording procedures
- identifying electrical plant status
- implementing legislation, industry standards, codes of practice and regulations
- interpreting electrical plant manufacturers' specifications and manuals
- interpreting remote indication of electrical plant status and condition
- maintaining electrical plant integrity
- preparing and planning electrical plant and equipment
- recognising abnormal electrical plant operating conditions using data acquisition techniques and tools
- working with permit to work system

Knowledge Evidence

Evidence required to demonstrate competence in this unit must be relevant to and satisfy all the requirements of the elements, performance criteria and range of conditions and includes knowledge of:

- electrical plant and equipment, its location and operating parameters
- electrical plant status
- legislation, industry standards, codes of practice and regulations
- manufacturers' specifications and manuals
- operational checks on in-service electrical plant

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- permit to work system
- typical arrangements of power production plant
- WHS/OHS legislated requirements including:
  - emergency procedures
  - risk control measures
  - safe working practices
- workplace policies and procedures
- workplace documentation

Assessment Conditions

As a minimum, assessors must satisfy applicable regulatory requirements, which include requirements in the Standards for Registered Training Organisations current at the time of assessment.

As a minimum, assessment must satisfy applicable regulatory requirements, which include requirements in the Standards for Registered Training Organisations current at the time of assessment.

Assessment processes and techniques must be appropriate to the language, literacy and numeracy requirements of the work being performed and the needs of the candidate.

Assessment must occur in workplace operational situations. Where this is not appropriate, assessment must occur in simulated workplace operational situations that reflect workplace conditions.

Resources for assessment must include access to:

- a range of relevant exercises, case studies and/or other simulations
- relevant and appropriate materials, tools, equipment and personal protective equipment currently used in industry
- applicable documentation including workplace procedures, industry standards, equipment specifications, regulations, codes of practice and operation manuals.

Links

Companion Volume implementation guides are found in VETNet - https://vetnet.gov.au/Pages/TrainingDocs.aspx?q=1715b9fa-e7bd-441c-bb8d-cf22c9c825a8

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UEPOPS372 Operate and monitor generator/alternator auxiliary plant

Modification History

Release 1. This is the first release of this unit of competency in the UEP Generation Training Package.

Application

This unit involves the skills and knowledge required to operate, inspect and monitor generator and/or alternator auxiliary plant, including stator water systems, hydrogen cooling systems, seal oil and lubricating oil systems.

A power generation facility's auxiliary equipment and systems are designed to keep power generating plant operating smoothly in a variety of circumstances.

Competency in this unit requires the ability to plan work, operate generator and/or alternator auxiliary plant, test generator and/or alternator auxiliary plant, analyse generator and/or alternator auxiliary plant faults, monitor and inspect generator and/or alternator auxiliary plant and the completion of all documentation. Individuals will, in general, work under supervision, in a power generation facility as an operator.

Power generation plant operators are typically trained and authorised to isolate, prepare plant and issue permits to work.

No licensing, legislative or certification requirements apply to this unit at the time of publication.

Note: Workplace practice

The application of the skills and knowledge described in this unit may require a licence or training permit to practice in the workplace where work is carried out on gas and electrical installations. Additional conditions may apply under state and territory legislative and regulatory licensing requirements.

Pre-requisite Unit

There are no prerequisite units.

Competency Field

Operations

Unit Sector

Electricity generation

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Elements and Performance Criteria

ELEMENTS	PERFORMANCE CRITERIA
Elements describe the essential outcomes.	Performance criteria describe the performance needed to demonstrate achievement of the element.
1 Plan and prepare work	**1.1** Safety issues related to operating and monitoring generator and/or alternator auxiliary plant are identified, in accordance with workplace procedures and Work, Health and Safety (WHS)/Occupational Health and Safety(OHS) regulations and legislative requirements
	1.2 Work requirements and generator and/or alternator auxiliary plant are identified from appropriate personnel and documentation, in accordance with workplace procedures
	1.3 Generator and/or alternator auxiliary running up and loading schedule is ascertained from relevant documentation, in accordance with workplace procedures and site requirements
	1.4 Inspection, preoperational tests and field preparations for generator and/or alternator auxiliary plant service are carried out, in accordance with workplace procedures and manufacturers' recommendations
	1.5 Generator and/or alternator auxiliary plant operational prerequisites are established, in accordance with workplace procedures and manufacturers' recommendations
	1.6 Sequence for recommissioning of generator and/or alternator auxiliary plant is determined, in accordance with workplace procedures and site requirements
2 Operate generator/alternator auxiliary plant	**2.1** Generator and/or alternator auxiliary plant is operated within limits of its' design and regulators requirements, in accordance with workplace procedures
	2.2 Generator and/or alternator auxiliary plant is monitored and observed, in accordance with workplace procedures, to detect deviations from required operating conditions
	2.3 Corrective actions are taken to rectify generator and/or alternator auxiliary plant abnormalities, in accordance with workplace procedures and manufacturers' recommendations

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3	**Test generator/alternator auxiliary plant operation**	**3.1** Operational tests are performed, in accordance with workplace procedures
		3.2 Generator and/or alternator auxiliary plant is observed for correct operational response, in accordance with workplace procedures
		3.3 Corrective action is taken, in accordance with workplace procedures, when response does not meet with documentation, generator or alternator auxiliary plant integrity or personnel safety requirements
		3.4 Generator and/or alternator auxiliary plant is returned to required operational status upon completion of testing, in accordance with workplace procedures
4	**Analyse generator/alternator auxiliary plant faults**	**4.1** Cause of abnormal generator and/or alternator auxiliary plant operating conditions are identified, in accordance with workplace procedures, by analysing technical and operational information
		4.2 Corrective actions to rectify generator and/or alternator auxiliary plant faults are determined, in accordance with workplace procedures
		4.3 Generator and/or alternator auxiliary plant integrity and personnel safety is maintained, in accordance with workplace procedures, and in consultation with appropriate personnel and technical and operational documentation
5	**Monitor and inspect generator/alternator auxiliary plant**	**5.1** Generator and/or alternator auxiliary plant to be monitored and inspected is physically identified, in accordance with workplace procedures
		5.2 Generator and/or alternator auxiliary plant is monitored and inspected, in accordance with workplace procedures, for normal operation or to detect deviations
		5.3 Corrective action is taken, in accordance with workplace procedures
		5.4 Appropriate personnel are notified, in accordance with workplace procedures, when defects are detected
6	**Complete documentation**	**6.1** Generator and/or alternator auxiliary plant problems, movements, and status are reported, in accordance with workplace procedures

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6.2 Documentation is updated, in accordance with workplace procedures

Foundation Skills

Foundation skills essential to performance are explicit in the performance criteria of this unit of competency.

Range of Conditions

Range is restricted to essential operating conditions and any other variables essential to the work environment.

Non-essential conditions may be found in the Companion Volume Implementation Guide.

Unit Mapping Information

This unit replaces and is equivalent to UEPOPS372A Operate and monitor generator/alternator auxiliary plant.

Links

Companion Volume implementation guides are found in VETNet - https://vetnet.gov.au/Pages/TrainingDocs.aspx?q=1715b9fa-e7bd-441c-bb8d-cf22c9c825a8

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Assessment Requirements for UEPOPS372 Operate and monitor generator/alternator auxiliary plant

Modification History

Release 1. This is the first release of this unit of competency in the UEP Generation Training Package.

Performance Evidence

Evidence required to demonstrate competence in this unit must be relevant to and satisfy all the requirements of the elements, performance criteria and range of conditions on at least two separate occasions and includes:

- analysing generator and/or alternator auxiliary plant faults using data analysis techniques and tools
- applying Work, Health and Safety (WHS)/Occupational Health and Safety (OHS) requirements including:
  - emergency procedures
  - risk control measures
  - safe working practices
- communicating with personnel
- completing documentation using recording procedures
- identifying generator and/or alternator auxiliary plant status
- implementing legislation, industry standards, codes of practice and regulations
- interpreting manufacturers' specifications and manuals
- monitoring and inspecting generator and/or alternator auxiliary plant operation
- operating generator and/or alternator auxiliary plant
- organising resources
- recognising and responding to abnormal generator and/or alternator auxiliary plant operating conditions
- testing generator and/or alternator auxiliary plant operationally using diagnostic and test techniques
- working with generator and/or alternator auxiliary plant and/or equipment
- working with permit to work system

Knowledge Evidence

Evidence required to demonstrate competence in this unit must be relevant to and satisfy all the requirements of the elements, performance criteria and range of conditions and includes knowledge of:

- generator and/or alternator auxiliary plant and equipment, its location and operating

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parameters
- legislation, industry standards, codes of practice and regulations
- manufacturers' specifications and manuals
- permit to work system
- typical arrangements of power production plant
- WHS/OHS legislated requirements including:
  - emergency procedures
  - risk control measures
  - safe working practices
- workplace documentation
- workplace policies and procedures

Assessment Conditions

As a minimum, assessors must satisfy applicable regulatory requirements, which include requirements in the Standards for Registered Training Organisations current at the time of assessment.

As a minimum, assessment must satisfy applicable regulatory requirements, which include requirements in the Standards for Registered Training Organisations current at the time of assessment.

Assessment processes and techniques must be appropriate to the language, literacy and numeracy requirements of the work being performed and the needs of the candidate.

Assessment must occur in workplace operational situations. Where this is not appropriate, assessment must occur in simulated workplace operational situations that reflect workplace conditions.

Resources for assessment must include access to:

- a range of relevant exercises, case studies and/or other simulations
- relevant and appropriate materials, tools, equipment and personal protective equipment currently used in industry
- applicable documentation including workplace procedures, industry standards, equipment specifications, regulations, codes of practice and operation manuals.

Links

Companion Volume implementation guides are found in VETNet - https://vetnet.gov.au/Pages/TrainingDocs.aspx?q=1715b9fa-e7bd-441c-bb8d-cf22c9c825a8

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UEPOPS402 Conduct multiple energy source isolation procedures for permit to work

Modification History

Release 1. This is the first release of this unit of competency in the UEP Generation Training Package.

Application

This unit involves the skills and knowledge required for the application of permit to work procedures where multiple energy sources require isolation for safe access to high voltage, low voltage or mechanical apparatus.

Permits to work are a formal system used to control high risk activities in power generation facilities. They specify the control measures that will be put in place to minimise risks. Permits ensure that all hazards and precautions have been considered before any hazardous work begins.

Competency in this unit requires the ability to plan and prepare for isolation, de-isolation and restoration, perform isolation and perform de-isolation and restoration. Individuals will, in general, work as an operator in a power generation facility.

Power generation plant operators are typically trained and authorised to isolate, prepare plant and issue permits to work.

No licensing, legislative or certification requirements apply to this unit at the time of publication.

Note: Workplace practice

The application of the skills and knowledge described in this unit may require a licence or training permit to practice in the workplace where work is carried out on gas and electrical installations. Additional conditions may apply under state and territory legislative and regulatory licensing requirements.

Pre-requisite Unit

UEPOPS301 Conduct single energy source isolation procedures for permit to work.

Competency Field

Operations

Unit Sector

Electricity generation

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Elements and Performance Criteria

ELEMENTS	PERFORMANCE CRITERIA
Elements describe the essential outcomes.	Performance criteria describe the performance needed to demonstrate achievement of the element.
1 Plan and prepare for multiple energy source isolation	**1.1** Work requirements, including permit to work, are identified and confirmed, in accordance with workplace procedures, with appropriate personnel or by site inspection
	1.2 Safety issues, Work, Health and Safety (WHS)/Occupational Health and Safety (OHS) regulations and industry standards are identified, in accordance with workplace procedures
	1.3 Materials, tools, equipment and resources to satisfy job plan and permit to work requirements are requisitioned and inspected for compliance, in accordance with workplace procedures
	1.4 Isolation work is planned sequenced and prioritised, in accordance with workplace procedures and permit requirements
	1.5 Permit to work and risk assessment are coordinated with other personnel involved in, or affected by isolations, in accordance with workplace procedures
	1.6 Personnel participating in work are briefed and roles and responsibilities are confirmed, in accordance with workplace procedures
2 Perform multiple energy source isolation	**2.1** Multiple energy source to be isolated is correctly identified, in accordance with workplace procedures
	2.2 Isolation is performed, in accordance with workplace procedures and permit to work requirements
	2.3 Verification of isolation, dissipation and restraint of energy sources is performed, in accordance with workplace procedures
	2.4 Isolation is confirmed, in accordance with workplace procedures
3 Perform multiple energy source de-isolation and	**3.1** Multiple energy source de-isolation and restorations are performed, in accordance with workplace procedures

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restoration	and permit to work requirements
	3.2 Multiple energy source de-isolations are confirmed, in accordance with workplace procedures
	3.3 Work completion details are finalised, in accordance with workplace procedures

Foundation Skills

Foundation skills essential to performance are explicit in the performance criteria of this unit of competency.

Range of Conditions

Range is restricted to essential operating conditions and any other variables essential to the work environment.

Non-essential conditions may be found in the Companion Volume Implementation Guide.

Unit Mapping Information

This unit replaces and is equivalent to UEPOPS402B Conduct multiple energy source isolation procedures for permit to work.

Links

Companion Volume implementation guides are found in VETNet - https://vetnet.gov.au/Pages/TrainingDocs.aspx?q=1715b9fa-e7bd-441c-bb8d-cf22c9c825a8

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Assessment Requirements for UEPOPS402 Conduct multiple energy source isolation procedures for permit to work

Modification History

Release 1. This is the first release of this unit of competency in the UEP Generation Training Package.

Performance Evidence

Evidence required to demonstrate competence in this unit must be relevant to and satisfy all the requirements of the elements, performance criteria and range of conditions on at least two separate occasions and includes:

- applying Work, Health and Safety (WHS)/Occupational Health and Safety (OHS) requirements including:
  - emergency procedures
  - hazard identification
  - risk control measures
  - safe working practices
- communicating with personnel and stakeholders
- completing documentation
- coordinating and briefing others on permit to work
- identifying power generating plant status
- implementing legislation, industry standards, codes of practice and regulations
- interpreting plant drawings, diagrams and manufacturers manuals
- performing isolations, de-isolations and restorations
- planning and preparing for isolation, de-isolation and restoration
- preparing power generating plant or equipment for isolation operation
- using permit to work system
- working with equipment, tools, materials and resources

Knowledge Evidence

Evidence required to demonstrate competence in this unit must be relevant to and satisfy all the requirements of the elements, performance criteria and range of conditions and includes knowledge of:

- documentation requirements
- isolation, de-isolation and restoration techniques
- legislation, industry standards, codes of practice and regulations
- manufacturers' specifications and manuals

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- mechanical and electrical equipment isolation techniques
- mechanical and electrical isolation equipment types and characteristics
- permit to work system
- power generating plant and equipment, its location and operating parameters
- power generating plant status
- tools, materials and resources
- typical arrangements of power production plant
- WHS/OHS legislated requirements including:
  - emergency procedures
  - hazard identification
  - risk control measures
  - safe working practices
- workplace documentation
- workplace policies and procedures

Assessment Conditions

As a minimum, assessors must satisfy applicable regulatory requirements, which include requirements in the Standards for Registered Training Organisations current at the time of assessment.

As a minimum, assessment must satisfy applicable regulatory requirements, which include requirements in the Standards for Registered Training Organisations current at the time of assessment.

Assessment processes and techniques must be appropriate to the language, literacy and numeracy requirements of the work being performed and the needs of the candidate.

Assessment must occur in workplace operational situations. Where this is not appropriate, assessment must occur in simulated workplace operational situations that reflect workplace conditions.

Resources for assessment must include access to:

- a range of relevant exercises, case studies and/or other simulations
- relevant and appropriate materials, tools, equipment and personal protective equipment currently used in industry
- applicable documentation including workplace procedures, industry standards, equipment specifications, regulations, codes of practice and operation manuals.

Links

Companion Volume implementation guides are found in VETNet - https://vetnet.gov.au/Pages/TrainingDocs.aspx?q=1715b9fa-e7bd-441c-bb8d-cf22c9c825a8

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UEPOPS403 Coordinate permit to work system

Modification History

Release 1. This is the first release of this unit of competency in the UEP Generation Training Package.

Application

This unit involves the skills and knowledge required to coordinate the permit to work system in a power generation facility inclusive of its implementation and application on a day to day basis, during major power outages and in other projects.

Permits to work are a formal system used to control high risk activities in power generation facilities. They specify control measures to be used. Permits to work ensure that all hazards and precautions have been considered before any hazardous work begins.

Competency in this unit requires the ability to plan implementation of permit to work procedures, coordination of power outage permit to work requirements and coordination of the permit to work system. Individuals will, in general, work as a coordinator, in a power generation facility.

Power generation plant operators are typically trained and authorised to isolate, prepare plant and issue permits to work.

No licensing, legislative or certification requirements apply to this unit at the time of publication.

Note: Workplace practice

The application of the skills and knowledge described in this unit may require a licence or training permit to practice in the workplace where work is carried out on gas and electrical installations. Additional conditions may apply under state and territory legislative and regulatory licensing requirements.

Pre-requisite Unit

UEPOPS402 Conduct multiple energy source isolation procedures for permit to work

Competency Field

Operations

Unit Sector

Electricity generation

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Elements and Performance Criteria

ELEMENTS	PERFORMANCE CRITERIA
Elements describe the essential outcomes.	Performance criteria describe the performance needed to demonstrate achievement of the element.
1 Implement permit to work procedures	**1.1** Permit to work requirements are identified from appropriate personnel and documentation, in accordance with workplace procedures
	1.2 Permit to work is implemented, in accordance with legislative requirements and workplace procedures
	1.3 Power generation plant isolations are coordinated and confirmed with appropriate personnel, in accordance with workplace procedures
	1.4 Issue, cancellation and recording of permits to work is carried out, in accordance with workplace procedures
	1.5 Power generation plant de-isolation and restoration is coordinated with appropriate personnel, in accordance with workplace procedures
	1.6 Documentation is completed, in accordance with workplace procedures
2 Coordinate permit to work requirements	**2.1** Power outage plan is obtained from and confirmed with appropriate personnel, in accordance with workplace procedures
	2.2 Critical paths, major milestones and potential conflicts between permits to work for power outage work are identified and assessed, in accordance with workplace procedures
	2.3 Permits to work are detailed in maintenance plan and work is structured, in accordance with workplace procedures, to not impact power outage targets
	2.4 Resources are obtained and utilised, in accordance with workplace procedures, to ensure power outage plan targets are maintained
	2.5 Issue and cancellation of permits to work is coordinated, in accordance with workplace procedures
	2.6 De-isolation and restoration of power generation plant is planned and coordinated, in accordance with workplace

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		procedures, to meet recommissioning targets
	2.7	Records are maintained during power outages, in accordance with workplace procedures and site requirements
3 Report on permit to work system	**3.1**	Permit to work system is monitored and reviewed, and results are evaluated, in accordance with workplace procedures
	3.2	Results are documented and reports are confirmed with appropriate personnel, in accordance with workplace procedures
	3.3	Permit to work system incidents are identified, in accordance with workplace procedures
	3.4	Permit to work incidents are investigated and assessed, in accordance with workplace procedures

Foundation Skills

Foundation skills essential to performance are explicit in the performance criteria of this unit of competency.

Range of Conditions

Range is restricted to essential operating conditions and any other variables essential to the work environment.

Non-essential conditions may be found in the Companion Volume Implementation Guide.

Unit Mapping Information

This unit replaces and is equivalent to UEPOPS403B Coordinate permit to work system.

Links

Companion Volume implementation guides are found in VETNet - https://vetnet.gov.au/Pages/TrainingDocs.aspx?q=1715b9fa-e7bd-441c-bb8d-cf22c9c825a8

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Assessment Requirements for UEPOPS403 Coordinate permit to work system

Modification History

Release 1. This is the first release of this unit of competency in the UEP Generation Training Package.

Performance Evidence

Evidence required to demonstrate competence in this unit must be relevant to and satisfy all the requirements of the elements, performance criteria and range of conditions on at least two separate occasions and includes:

- applying Work, Health and Safety (WHS)/Occupational Health and Safety (OHS) requirements including:
  - emergency procedures
  - risk control measures
  - safe working practices
- communicating with personnel and stakeholders
- coordinating power outage permit to work requirements
- coordinating the permit to work system by utilising planning principles and techniques
- evaluating permit to work system using data analysis techniques and tools
- identifying power generating plant status including locating power generating plant and equipment
- identifying power outage requirements
- implementing legislation, industry standards, codes of practice and regulations
- interpreting manufacturers' specifications and manuals
- reporting on permit to work system
- using mechanical equipment isolation techniques
- using permit to work procedures

Knowledge Evidence

Evidence required to demonstrate competence in this unit must be relevant to and satisfy all the requirements of the elements, performance criteria and range of conditions and includes knowledge of:

- coordination of permit to work systems
- evaluation and analysis techniques
- legislation, industry standards, codes of practice and regulations
- manufacturers' specifications and manuals
- mechanical and electrical equipment isolation techniques

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- power generation plant and equipment, its location and operating parameters
- power generation plant status
- typical arrangements of power production plant
- WHS/OHS legislated requirements including:
  - emergency procedures
  - risk control measures
  - safe working practices
- workplace documentation
- workplace policies and procedures

Assessment Conditions

As a minimum, assessors must satisfy applicable regulatory requirements, which include requirements in the Standards for Registered Training Organisations current at the time of assessment.

As a minimum, assessment must satisfy applicable regulatory requirements, which include requirements in the Standards for Registered Training Organisations current at the time of assessment.

Assessment processes and techniques must be appropriate to the language, literacy and numeracy requirements of the work being performed and the needs of the candidate.

Assessment must occur in workplace operational situations. Where this is not appropriate, assessment must occur in simulated workplace operational situations that reflect workplace conditions.

Resources for assessment must include access to:

- a range of relevant exercises, case studies and/or other simulations
- relevant and appropriate materials, tools, equipment and personal protective equipment currently used in industry
- applicable documentation including workplace procedures, industry standards, equipment specifications, regulations, codes of practice and operation manuals.

Links

Companion Volume implementation guides are found in VETNet - https://vetnet.gov.au/Pages/TrainingDocs.aspx?q=1715b9fa-e7bd-441c-bb8d-cf22c9c825a8

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UEPOPS404 Coordinate first response team operation

Modification History

Release 2. This is the second release of this unit in the Electricity Supply Industry - Generation Sector Training Package. The following modification has been made:

- UEPOPS210 Conduct first response within a workplace team deleted due to zero enrolment.

Release 1. This is the first release of this unit of competency in the UEP Generation Training Package.

Application

This unit involves the skills and knowledge required to coordinate the operations of a first response team. Coordinators will organise workplace emergency response procedures and communicate with external emergency agencies.

A first response team prepares for and responds to emergency incidents that pose an immediate risk to a power generation facility. The operation of a first response team is to support emergency service agencies.

Competency in this unit requires the ability to coordinate a workplace emergency team, cooperate with other emergency services personnel, evaluate an emergency, respond to an emergency and to report the outcomes of an emergency response. Individuals will, in general, work as an operator, with coordination responsibilities, in a power generation facility.

Power generation plant operators are typically trained and authorised to isolate, prepare plant and issue permits to work.

No licensing, legislative or certification requirements apply to this unit at the time of publication.

Note: Workplace practice

The application of the skills and knowledge described in this unit may require a licence or training permit to practice in the workplace where work is carried out on gas and electrical installations. Additional conditions may apply under state and territory legislative and regulatory licensing requirements.

Pre-requisite Unit

Not applicable.

Competency Field

Operations

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Unit Sector

Electricity generation

Elements and Performance Criteria

ELEMENTS	PERFORMANCE CRITERIA
Elements describe the essential outcomes.	Performance criteria describe the performance needed to demonstrate achievement of the element.
1 Coordinate workplace first response team	**1.1** First response team purpose is identified and clarified with appropriate personnel, in accordance with workplace procedures
	1.2 Duties and responsibilities of first response team members are identified, in accordance with workplace procedures
	1.3 Instructions are relayed to first response team members, in accordance with workplace procedures
	1.4 First response team member identification is displayed, in accordance with workplace procedures
2 Cooperate with emergency services personnel	**2.1** Responsibilities of emergency services personnel are clarified to first response team members, in accordance with workplace procedures
	2.2 Role and authority of emergency services is discussed with first response team members, in accordance with workplace procedures
	2.3 Instructions from emergency services personnel are clarified and coordinated, in accordance with workplace procedures
	2.4 Guidance and assistance for emergency services personnel is coordinated, in accordance with workplace procedures
	2.5 Directions and advice are given to emergency service personnel and first response team members, in accordance with workplace procedures, after emergency site inspection
	2.6 An emergency plan to ensure personnel safety and power generating plant integrity is developed, in accordance with legislative requirements, industry

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		standards and workplace procedures
	2.7	Relevant documentation is obtained and used, in accordance with workplace procedures
	2.8	Materials, equipment and resources are obtained and coordinated, in accordance with workplace procedures
3 Evaluate emergency	**3.1**	Nature, extent and cause of emergency is identified, in accordance with workplace procedures
	3.2	Potential risks to personnel, equipment, environment and power generation production is identified, in accordance with workplace procedures
	3.3	Notification of emergency is undertaken, in accordance with workplace procedures
	3.4	Emergency evacuation procedures are followed, where appropriate, in accordance with workplace procedures
	3.5	Requirement for special expert assistance is identified, in accordance with workplace procedures
	3.6	Emergency incident is evaluated, in accordance with workplace procedures, to prevent repetition
	3.7	Location of emergency is identified and most effective route is determined, in accordance with workplace procedures
4 Respond to emergency	**4.1**	Vehicles and buildings are secured and protected, in accordance with workplace procedures and emergency plan requirements
	4.2	Potential sources of danger are isolated, and warning signs, signals and barriers are put in place, in accordance with workplace procedures
	4.3	Emergency incident responses are applied, in accordance with emergency plan requirements and workplace procedures
	4.4	Communication is established with key stakeholders and emergency services personnel, in accordance with workplace procedures
	4.5	Use of personal protective equipment during emergency incident is monitored, in accordance with workplace procedures

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	4.6	Technical advice to emergency service personnel is given, in accordance with workplace procedures
5 Report outcomes of emergency response	**5.1**	Fire and emergency equipment is marked or positioned after use, in accordance with workplace procedures, to indicate servicing or replacing
	5.2	Use of emergency equipment is reported, in accordance with workplace procedures
	5.3	Debriefing is attended and responded to, in accordance with workplace procedures
	5.4	First response team outcomes are evaluated, and recommendations are submitted for consideration, in accordance with workplace procedures

Foundation Skills

Foundation skills essential to performance are explicit in the performance criteria of this unit of competency.

Range of Conditions

Range is restricted to essential operating conditions and any other variables essential to the work environment.

Non-essential conditions may be found in the Companion Volume Implementation Guide.

Unit Mapping Information

This unit replaces and is equivalent to UEPOPS404B Coordinate first response team operation.

Links

Companion Volume implementation guides are found in VETNet - https://vetnet.gov.au/Pages/TrainingDocs.aspx?q=1715b9fa-e7bd-441c-bb8d-cf22c9c825a8

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Assessment Requirements for UEPOPS404 Coordinate first response team operation

Modification History

Release 2. This is the second release of this unit in the Electricity Supply Industry - Generation Sector Training Package. The following modification has been made:

- UEPOPS210 Conduct first response within a workplace team deleted due to zero enrolment.

Release 1. This is the first release of this unit of competency in the UEP Generation Training Package.

Performance Evidence

Evidence required to demonstrate competence in this unit must be relevant to and satisfy all the requirements of the elements, performance criteria and range of conditions on at least two separate occasions and includes:

- applying emergency and evacuation techniques and procedures
- applying Work, Health and Safety (WHS)/Occupational Health and Safety (OHS) requirements including:
  - risk control measures
  - safe working practices including use of Personal Protective Equipment (PPE)
- classifying fires and emergencies
- communicating with personnel and external organisations and/or agencies during an emergency
- cooperating with emergency services personnel
- coordinating workplace first response team
- evaluating emergency incidents
- evaluating first response plans and team outcomes
- identifying potential hazards
- identifying roles and responsibilities including team work
- implementing legislation, industry standards, codes of practice and regulations
- implementing safety procedures
- locating power generating plant and equipment
- preparing first responder emergency equipment for operation
- reporting outcomes of first response team
- responding to emergency incidents
- utilising emergency plans

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Knowledge Evidence

Evidence required to demonstrate competence in this unit must be relevant to and satisfy all the requirements of the elements, performance criteria and range of conditions and includes knowledge of:

- classification of fires and emergencies
- communication with personnel and external agencies
- emergency plans
- emergency responses
- equipment for first response tasks including emergency warning signs
- evaluation of outcomes
- legislation, industry standards, codes of practice and regulations
- potential hazards
- power generating plant and equipment, its location and operating parameters
- power generating plant status
- role and responsibilities of emergency services
- role of the first response team and its members
- WHS/OHS legislated requirements including:
  - risk control measures
  - safe working practices including use of Personal Protective Equipment (PPE)
- workplace documentation
- workplace policies and procedures

Assessment Conditions

As a minimum, assessors must satisfy applicable regulatory requirements, which include requirements in the Standards for Registered Training Organisations current at the time of assessment.

As a minimum, assessment must satisfy applicable regulatory requirements, which include requirements in the Standards for Registered Training Organisations current at the time of assessment.

Assessment processes and techniques must be appropriate to the language, literacy and numeracy requirements of the work being performed and the needs of the candidate.

Assessment must occur in workplace operational situations. Where this is not appropriate, assessment must occur in simulated workplace operational situations that reflect workplace conditions.

Resources for assessment must include access to:

- a range of relevant exercises, case studies and/or other simulations
- relevant and appropriate materials, tools, equipment and personal protective equipment currently used in industry
- applicable documentation including workplace procedures, industry standards, equipment specifications, regulations, codes of practice and operation manuals.

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Links

Companion Volume implementation guides are found in VETNet - https://vetnet.gov.au/Pages/TrainingDocs.aspx?q=1715b9fa-e7bd-441c-bb8d-cf22c9c825a8

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UEPOPS405 Operate and monitor A.C. electrical systems

Modification History

Release 1. This is the first release of this unit of competency in the UEP Generation Training Package.

Application

This unit involves the skills and knowledge required to operate and monitor the local and remote operation of Alternate Current (A.C.) electrical systems including switchgears, switchboards, distribution systems and transformers.

The main functions of electrical systems in power generating facilities is to distribute electrical power to system components and to provide electrical protection for power sources and for the components.

Competency in this unit requires the ability to plan switching operations work; carry out operation of switchgears and switchboards; test switchgears and equipment operation; analyse A.C. electrical system, switchgear and equipment faults; inspect and monitor A.C. electrical system and switchboards and the completion of all documentation. Individuals will, in general, work under supervision, in a power generation facility as an operator.

Power generation plant operators are typically trained and authorised to isolate, prepare plant and issue permits to work.

No licensing, legislative or certification requirements apply to this unit at the time of publication.

Note: Workplace practice

The application of the skills and knowledge described in this unit may require a licence or training permit to practice in the workplace where work is carried out on gas and electrical installations. Additional conditions may apply under state and territory legislative and regulatory licensing requirements.

Pre-requisite Unit

There are no prerequisite units.

Competency Field

Operations

Unit Sector

Electricity generation

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Elements and Performance Criteria

ELEMENTS	PERFORMANCE CRITERIA
Elements describe the essential outcomes.	Performance criteria describe the performance needed to demonstrate achievement of the element.
1 Plan and prepare for switching operations	**1.1** Safety issues related to operating and monitoring Alternating Current (A.C.) electrical systems are identified, in accordance with workplace procedures and Work, Health and Safety (WHS)/Occupational Health and Safety (OHS) regulations and legislative requirements
	1.2 Work requirements are identified, in accordance with workplace procedures, from appropriate personnel and documentation
	1.3 Documentation to determine A.C. electrical system plant status is assessed and evaluated, in accordance with workplace procedures
	1.4 Equipment inspection, preoperational checks and preparations for A.C. electrical system service are carried out, in accordance with workplace procedures and manufacturers' recommendations
	1.5 Switchboard and electrical equipment operational prerequisites and switching sequences are established, in accordance with workplace procedures and manufacturers' recommendations
2 Carry out operation of switchgear and switchboards	**2.1** Operation of switchgear is carried out, in accordance with workplace procedures and manufacturers' recommendations
	2.2 Isolation, removal and reinstatement of switchgear, switchboards and rectification system is carried out, in accordance with workplace procedures and manufacturers' recommendations
	2.3 Paralleling and balancing requirements are assessed to meet A.C. electrical system stability, in accordance with workplace procedures
	2.4 Rectification system is operated, isolated and reinstated, in accordance with workplace procedures and manufacturers' recommendations

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3	**Test switchgear and equipment operation**	**3.1** Operational tests are performed, in accordance with workplace procedures
		3.2 Switchgear and equipment is observed for correct operational response, in accordance with workplace procedures
		3.3 Corrective action is taken, in accordance with workplace procedures, when switch gear and equipment response does not meet with documentation, A.C. electrical system integrity or personnel safety requirements
		3.4 Switchgear equipment is returned to required operational status upon completion of testing, in accordance with workplace procedures
4	**Analyse A.C. electrical system, switchgear and equipment faults**	**4.1** Causes of abnormal A.C. electrical system and switchgear operating conditions are identified, in accordance with workplace procedures, and by analysing technical and operational information
		4.2 Corrective action is taken, in accordance with workplace procedures
		4.3 A.C. electrical system and switchgear plant integrity and personnel safety are maintained, in accordance with workplace procedures, and in consultation with appropriate personnel and technical and operational documentation
5	**Inspect and monitor A.C. electrical system and switchboards**	**5.1** A.C. electrical system and switchgear to be monitored and inspected is physically identified, in accordance with workplace procedures
		5.2 A.C. electrical system and switchgear is monitored and inspected, in accordance with workplace procedures, for normal operation or to detect deviations
		5.3 Corrective action is taken, in accordance with workplace procedures
		5.4 Appropriate personnel are notified when A.C. electrical system defects and abnormal operating conditions are detected, in accordance with workplace procedures
6	**Complete documentation**	**6.1** A.C. electrical system equipment problems and status are reported, in accordance with workplace procedures
		6.2 Documentation is updated, in accordance with

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workplace procedures

Foundation Skills

Foundation skills essential to performance are explicit in the performance criteria of this unit of competency.

Range of Conditions

Range is restricted to essential operating conditions and any other variables essential to the work environment.

Non-essential conditions may be found in the Companion Volume Implementation Guide.

Unit Mapping Information

This unit replaces and is equivalent to UEPOPS405B Operate and monitor a.c. electrical systems.

Links

Companion Volume implementation guides are found in VETNet - https://vetnet.gov.au/Pages/TrainingDocs.aspx?q=1715b9fa-e7bd-441c-bb8d-cf22c9c825a8

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Assessment Requirements for UEPOPS405 Operate and monitor A.C. electrical systems

Modification History

Release 1. This is the first release of this unit of competency in the UEP Generation Training Package.

Performance Evidence

Evidence required to demonstrate competence in this unit must be relevant to and satisfy all the requirements of the elements, performance criteria and range of conditions on at least two separate occasions and includes:

- analysing equipment, A.C. electrical system and protection faults using data analysis techniques and tools
- applying Work, Health and Safety (WHS)/Occupational Health and Safety (OHS) requirements including:
  - emergency procedures
  - risk control measures
  - safe working practices
- communicating with personnel
- completing documentation using recording procedures
- conducting switching operations
- identifying A.C. electrical system plant status
- implementing legislation, industry standards, codes of practice and regulations
- interpreting manufacturers' specifications and manuals
- monitoring and inspecting equipment, A.C. electrical system and protection operation
- operating switchgear and equipment
- organising resources
- preparing A.C. electrical system plant and/or equipment for operation
- recognising and responding to abnormal A.C. electrical system plant operating conditions
- testing A.C. electrical system plant operationally using diagnostic and test techniques
- working with permit to work system

Knowledge Evidence

Evidence required to demonstrate competence in this unit must be relevant to and satisfy all the requirements of the elements, performance criteria and range of conditions and includes knowledge of:

- A.C. electrical system plant and equipment, its location and operating parameters
- A.C. electrical system plant status

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- legislation, industry standards, codes of practice and regulations
- manufacturers' specifications and manuals
- permit to work system
- switchgear - operation, isolation and earthing
- switching practices and procedures
- typical arrangements of power production plant
- WHS/OHS legislated requirements including:
  - emergency procedures
  - risk control measures
  - safe working practices
- workplace documentation
- workplace policies and procedures

Assessment Conditions

As a minimum, assessors must satisfy applicable regulatory requirements, which include requirements in the Standards for Registered Training Organisations current at the time of assessment.

As a minimum, assessment must satisfy applicable regulatory requirements, which include requirements in the Standards for Registered Training Organisations current at the time of assessment.

Assessment processes and techniques must be appropriate to the language, literacy and numeracy requirements of the work being performed and the needs of the candidate.

Assessment must occur in workplace operational situations. Where this is not appropriate, assessment must occur in simulated workplace operational situations that reflect workplace conditions.

Resources for assessment must include access to:

- a range of relevant exercises, case studies and/or other simulations
- relevant and appropriate materials, tools, equipment and personal protective equipment currently used in industry
- applicable documentation including workplace procedures, industry standards, equipment specifications, regulations, codes of practice and operation manuals.

Links

Companion Volume implementation guides are found in VETNet - https://vetnet.gov.au/Pages/TrainingDocs.aspx?q=1715b9fa-e7bd-441c-bb8d-cf22c9c825a8

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UEPOPS406 Operate and monitor D.C. electrical systems

Modification History

Release 1. This is the first release of this unit of competency in the UEP Generation Training Package.

Application

This unit involves the skills and knowledge required to operate and monitor local and remote operation of Direct Current (D.C.) electrical system including switchgears, ring mains, switchboards, rectification and distribution systems.

Electrical systems in power generating facilities distribute electrical power to system components and provide electrical protection for power sources and components.

Competency in this unit requires the ability to plan switching operations work, carry out operation of switch gears, switch boards and rectification systems, test switch gear and rectification equipment operation, analyse switch gear and rectification system equipment faults, inspect and monitor switch gear and switch board systems and the completion of all documentation. Individuals will, in general, work under supervision, in a power generation facility as an operator.

Power generation plant operators are typically trained and authorised to isolate, prepare plant and issue permits to work.

No licensing, legislative or certification requirements apply to this unit at the time of publication.

Note: Workplace practice

The application of the skills and knowledge described in this unit may require a licence or training permit to practice in the workplace where work is carried out on gas and electrical installations. Additional conditions may apply under state and territory legislative and regulatory licensing requirements.

Pre-requisite Unit

There are no prerequisite units.

Competency Field

Operations

Unit Sector

Electricity generation

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Elements and Performance Criteria

ELEMENTS	PERFORMANCE CRITERIA
Elements describe the essential outcomes.	Performance criteria describe the performance needed to demonstrate achievement of the element.
1 Plan and prepare for switching operations	**1.1** Safety issues related to operating and monitoring Direct Current (D.C.) electrical system plant are identified, in accordance with workplace procedures and Work, Health and Safety (WHS)/Occupational Health and Safety (OHS) regulations and legislative requirements
	1.2 Work requirements are identified, in accordance with workplace procedures, from appropriate personnel and documentation
	1.3 Documentation to determine D.C. electrical system plant status is assessed and evaluated, in accordance with workplace procedures
	1.4 Equipment inspection, preoperational check and field preparation for D.C. electrical system service is carried out, in accordance with workplace procedures and manufacturers' recommendations procedures
	1.5 Switchboard and equipment operational prerequisites and switching sequences are established, in accordance with workplace procedures and manufacturers' recommendations
2 Carry out operation of switchgears, switchboards and rectification systems	**2.1** Operation of switchgear is carried out, in accordance with workplace procedures and manufacturers' recommendations
	2.2 Isolation, removal and reinstatement of switchgear, switchboards and rectification systems are carried out, in accordance with workplace procedures and manufacturers' recommendations
	2.3 Paralleling and balancing requirements are assessed, in accordance with workplace procedures, to meet D.C. electrical system stability
	2.4 Rectification system is operated, isolated and reinstated, in accordance with workplace procedures and manufacturers' recommendations
3 Test switchgear and rectification equipment	**3.1** Operational tests are performed, in accordance with

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operation		workplace procedures
	3.2	Switchgear and/or rectification system equipment is observed for correct operational response, in accordance with workplace procedures
	3.3	Corrective action is taken, in accordance with workplace procedures, when response does not meet with documentation, D.C. electrical system integrity or personnel safety requirements
	3.4	Switchgear and/or rectification system equipment is returned to required operational status upon completion of testing, in accordance with workplace procedures
4 Analyse system, switchgear and rectification equipment faults	**4.1**	Causes of abnormal D.C. electrical system and switchgear operating conditions are identified, in accordance with workplace procedures, and by analysing technical and operational information
	4.2	Corrective action is taken, in accordance with workplace procedures
	4.3	D.C. electrical system, and switchgear plant integrity and personnel safety are maintained, in accordance with workplace procedures, and in consultation with appropriate personnel and technical and operational documentation
5 Inspect and monitor system and switchboards	**5.1**	D.C. electrical system and switchgear to be monitored and inspected is physically identified, in accordance with workplace procedures
	5.2	D.C. electrical system and switchgear is monitored and inspected, in accordance with workplace procedures, for normal operation or to detect deviations
	5.3	Corrective action is taken, in accordance with workplace procedures
	5.4	Appropriate personnel are notified, in accordance with workplace procedures, when defects and abnormal operating conditions are detected
6 Complete documentation	**6.1**	Equipment problems and status are reported, in accordance with workplace procedures
	6.2	Documentation is updated, in accordance with workplace procedures

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Foundation Skills

Foundation skills essential to performance are explicit in the performance criteria of this unit of competency.

Range of Conditions

Range is restricted to essential operating conditions and any other variables essential to the work environment.

Non-essential conditions may be found in the Companion Volume Implementation Guide.

Unit Mapping Information

This unit replaces and is equivalent to UEPOPS406B Operate and monitor d.c. electrical systems.

Links

Companion Volume implementation guides are found in VETNet - https://vetnet.gov.au/Pages/TrainingDocs.aspx?q=1715b9fa-e7bd-441c-bb8d-cf22c9c825a8

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Assessment Requirements for UEPOPS406 Operate and monitor D.C. electrical systems

Modification History

Release 1. This is the first release of this unit of competency in the UEP Generation Training Package.

Performance Evidence

Evidence required to demonstrate competence in this unit must be relevant to and satisfy all the requirements of the elements, performance criteria and range of conditions on at least two separate occasions and includes:

- analysing system, switchgear and rectification equipment, D.C. electrical system and protection faults using diagnostic and test techniques
- applying Work, Health and Safety (WHS)/Occupational Health and Safety (OHS) requirements including:
  - emergency procedure
  - risk control measures
  - safe working practices
- communicating with personnel
- completing documentation using recording procedures
- conducting switching, switchgear, switchboard and rectification system operations
- identifying D.C. electrical system plant status
- implementing legislation, industry standards, codes of practice and regulations
- interpreting manufacturers' specifications and manuals
- monitoring and inspecting equipment and D.C. electrical system operation
- operating switchgear and equipment
- organising resources
- preparing D.C. electrical system plant and/or equipment for operation
- recognising and responding to abnormal D.C. electrical system plant operating conditions
- testing D.C. electrical system, switchgear and rectification equipment operationally using data analysis techniques and tools
- working with permit to work system

Knowledge Evidence

Evidence required to demonstrate competence in this unit must be relevant to and satisfy all the requirements of the elements, performance criteria and range of conditions and includes knowledge of:

- D.C electrical system plant and equipment, its location and operating parameters

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- D.C electrical system plant status
- D.C. switchgear types and characteristics
- legislation, industry standards, codes of practice and regulations
- manufacturers' specifications and manuals
- permit to work system
- typical arrangements of power production plant
- WHS/OHS legislated requirements including:
  - emergency procedure
  - risk control measures
  - safe working practices
- workplace documentation
- workplace policies and procedures

Assessment Conditions

As a minimum, assessors must satisfy applicable regulatory requirements, which include requirements in the Standards for Registered Training Organisations current at the time of assessment.

As a minimum, assessment must satisfy applicable regulatory requirements, which include requirements in the Standards for Registered Training Organisations current at the time of assessment.

Assessment processes and techniques must be appropriate to the language, literacy and numeracy requirements of the work being performed and the needs of the candidate.

Assessment must occur in workplace operational situations. Where this is not appropriate, assessment must occur in simulated workplace operational situations that reflect workplace conditions.

Resources for assessment must include access to:

- a range of relevant exercises, case studies and/or other simulations
- relevant and appropriate materials, tools, equipment and personal protective equipment currently used in industry
- applicable documentation including workplace procedures, industry standards,
- equipment specifications, regulations, codes of practice and operation manuals.

Links

Companion Volume implementation guides are found in VETNet - https://vetnet.gov.au/Pages/TrainingDocs.aspx?q=1715b9fa-e7bd-441c-bb8d-cf22c9c825a8

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UEPOPS407 Start and run up gas turbine

Modification History

Release 1. This is the first release of this unit of competency in the UEP Generation Training Package.

Application

This unit involves the skills and knowledge required for the purging, ignition and establishment of combustion and run-up of a gas turbine to operational and synchronous speed.

A gas turbine may be operated as an individual unit on open cycle or as a component of a combined cycle plant consisting of a gas turbine, heat recovery steam generator and steam turbine.

Competency in this unit requires the ability to plan and prepare work, conduct gas turbine start and run up, test gas turbine plant, identify and respond to gas turbine plant operation and complete documentation. Individuals will, in general, work under supervision, in a power generation facility as an operator.

Power generation plant operators are typically trained and authorised to isolate, prepare plant and issue permits to work.

No licensing, legislative or certification requirements apply to this unit at the time of publication.

Note: Workplace practice

The application of the skills and knowledge described in this unit may require a licence or training permit to practice in the workplace where work is carried out on gas and electrical installations. Additional conditions may apply under state and territory legislative and regulatory licensing requirements.

Pre-requisite Unit

There are no prerequisite units

Competency Field

Operations

Unit Sector

Electricity generation

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Elements and Performance Criteria

ELEMENTS	PERFORMANCE CRITERIA
Elements describe the essential outcomes.	Performance criteria describe the performance needed to demonstrate achievement of the element.
1 Plan and prepare gas turbine start and run up work	**1.1** Safety issues are identified in accordance with workplace procedures, Work, Health and Safety (WHS)/Occupational Health and Safety (OHS) regulations and site requirements
	1.2 Work requirements are identified from appropriate personnel and documentation, in accordance with workplace procedures
	1.3 Preoperational checks are carried out on gas turbine plant, in accordance with manufacturers' recommendations and workplace procedures
2 Conduct gas turbine start and run up	**2.1** Preoperational conditions for gas turbine plant are established, in accordance with workplace procedures and site requirements
	2.2 Preoperational conditions of the Heat Recovery Steam Generator (HRSG), associated steam mains and steam turbine are established when gas turbine is a component of a combined unit, in accordance with workplace procedures
	2.3 Starting procedures and correct purge, ignition and run-up sequence are commenced and observed, in accordance with workplace
	2.4 Minimum operation of gas turbine is established and supported, in accordance with workplace procedures and manufacturers' recommendations
	2.5 Monitoring and control of HRSG drum level, feedwater flow, steam and metal temperature rates of rise, steam pressure rate of rise, steam flow and drainage are carried out where gas turbine is a component of a combined cycle unit, in accordance with workplace procedures
	2.6 Gas turbine exhaust temperature and flow to HRSG and gas turbine power output are monitored and adjusted to achieve required steam conditions, in accordance with workplace procedures

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	2.7	Generating plant is operated within limits of its' design, in accordance with workplace procedures
	2.8	Generating plant is monitored and observed, in accordance with workplace procedures, to detect deviations from required operating conditions
	2.9	Corrective action is taken to rectify gas turbine abnormalities, in accordance with manufacturers' recommendations and workplace procedures
3 Test gas turbine plant operation	**3.1**	Tests are performed, in accordance with workplace procedures
	3.2	Power generation system and gas turbine plant is observed, in accordance with workplace procedures, for correct operational response
	3.3	Corrective action is taken, in accordance with workplace procedures, when response does not meet documentation, plant integrity or personnel safety requirements
	3.4	Gas turbine plant is returned to required operational status upon completion of testing, in accordance with workplace procedures
4 Identify, respond and report on gas turbine plant operation and anomalies	**4.1**	Causes of abnormal gas turbine plant operating conditions are identified, in accordance with workplace procedures, by analysing technical and operational information
	4.2	Corrective action is taken, in accordance with workplace procedures
	4.3	Gas turbine plant integrity and personnel safety is maintained, in accordance with workplace procedures, through consultation with appropriate personnel and technical and operational documentation
	4.4	Appropriate personnel are notified, in accordance with workplace procedures, when defects are detected
5 Complete documentation	**5.1**	Gas turbine plant problems, movements, and status reported, in accordance with workplace procedures
	5.2	Documentation is updated, in accordance with workplace procedures

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Foundation Skills

Foundation skills essential to performance are explicit in the performance criteria of this unit of competency.

Range of Conditions

Range is restricted to essential operating conditions and any other variables essential to the work environment.

Non-essential conditions may be found in the Companion Volume Implementation Guide.

Unit Mapping Information

This unit replaces and is equivalent to UEPOPS407B Start and run up a gas turbine.

Links

Companion Volume implementation guides are found in VETNet - https://vetnet.gov.au/Pages/TrainingDocs.aspx?q=1715b9fa-e7bd-441c-bb8d-cf22c9c825a8

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Assessment Requirements for UEPOPS407 Start and run up gas turbine

Modification History

Release 1. This is the first release of this unit of competency in the UEP Generation Training Package.

Performance Evidence

Evidence required to demonstrate competence in this unit must be relevant to and satisfy all the requirements of the elements, performance criteria and range of conditions on at least two separate occasions and includes:

- applying Work, Health and Safety (WHS)/Occupational Health and Safety (OHS) legislation including:
  - emergency procedures
  - risk control measures
  - safe working practices
- communicating with personnel
- conducting gas turbine plant and equipment for start and run up operation
- identifying gas turbine plant status
- implementing legislation, industry standards, codes of practice and regulations
- monitoring and operating gas turbine plant and equipment
- organising resources
- planning gas turbine work
- recognising and responding to abnormal gas turbine plant operating conditions
- starting, running up and operating gas turbine and associated plant and equipment
- testing gas turbine plant operations using diagnostic and data analysis techniques and tools to determine faults
- using recording procedures to complete documentation
- working with permit to work system

Knowledge Evidence

Evidence required to demonstrate competence in this unit must be relevant to and satisfy all the requirements of the elements, performance criteria and range of conditions and includes knowledge of:

- gas turbine critical operating parameters
- legislation, industry standards, codes of practice and regulations
- manufacturers' specifications and manuals
- permit to work system

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- safety precautions associated with a gas turbine start up
- sequence of gas turbine operations
- techniques for operation of a gas turbine and associated plant and equipment
- typical arrangements of power generation plant
- Work, Health and Safety (WHS)/Occupational Health and Safety (OHS) legislation including:
  - risk control measures
  - emergency procedures
  - safe working practices
- workplace policies and procedures
- workplace documentation

Assessment Conditions

As a minimum, assessors must satisfy applicable regulatory requirements, which include requirements in the Standards for Registered Training Organisations current at the time of assessment.

As a minimum, assessment must satisfy applicable regulatory requirements, which include requirements in the Standards for Registered Training Organisations current at the time of assessment.

Assessment processes and techniques must be appropriate to the language, literacy and numeracy requirements of the work being performed and the needs of the candidate.

Assessment must occur in workplace operational situations. Where this is not appropriate, assessment must occur in simulated workplace operational situations that reflect workplace conditions.

Resources for assessment must include access to:

- a range of relevant exercises, case studies and/or other simulations
- relevant and appropriate materials, tools, equipment and personal protective equipment currently used in industry
- applicable documentation including workplace procedures, industry standards, equipment specifications, regulations, codes of practice and operation manuals.

Links

Companion Volume implementation guides are found in VETNet - https://vetnet.gov.au/Pages/TrainingDocs.aspx?q=1715b9fa-e7bd-441c-bb8d-cf22c9c825a8

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UEPOPS408 Shut down a gas turbine

Modification History

Release 1. This is the first release of this unit of competency in the UEP Generation Training Package.

Application

This unit involves the skills and knowledge required to shut down a gas turbine unit to a standby state.

Performing shut down procedures for a gas turbine unit will require the implementation of power generation facility procedures and provisions including manufacturers' recommendations and work site specific requirements.

Competency in this unit requires the ability to plan and prepare gas turbine shut down, shut down a gas turbine, test gas turbine plant operation, analyse power generation system faults and the completion of documentation. Individuals will, in general, work under supervision, in a power generation facility as an operator.

Power generation plant operators are typically trained and authorised to isolate, prepare plant and issue permits to work.

No licensing, legislative or certification requirements apply to this unit at the time of publication.

Note: Workplace practice

The application of the skills and knowledge described in this unit may require a licence or training permit to practice in the workplace where work is carried out on gas and electrical installations. Additional conditions may apply under state and territory legislative and regulatory licensing requirements.

Pre-requisite Unit

There are no prerequisite units.

Competency Field

Operations

Unit Sector

Electricity generation

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Elements and Performance Criteria

ELEMENTS	PERFORMANCE CRITERIA
Elements describe the essential outcomes.	Performance criteria describe the performance needed to demonstrate achievement of the element.
1 Plan and prepare gas turbine shut down work	**1.1** Safety issues are identified, in accordance with Work, Health and Safety (WHS)/Occupational Health and Safety (OHS) and workplace procedures
	1.2 Work requirements are identified from appropriate personnel and documentation, in accordance with workplace procedures
	1.3 Operational checks are carried out on gas turbine plant in accordance with manufacturers' specifications and workplace procedures
	1.4 Team and individual roles and responsibilities are identified, in accordance with workplace procedures and are recorded in the shutdown plan
2 Conduct gas turbine shut down	**2.1** Gas turbine is unloaded and shut down, in accordance with manufacturers' specifications, workplace procedures, site requirements and shut down plan
	2.2 Gas turbine exhaust gas flow and power output are adjusted when gas turbine is a component of a combined unit, in accordance with workplace procedures, to achieve required steam flow conditions
	2.3 Gas turbine and associated power generation plant is placed in a safe condition, in accordance with manufacturers' recommendations, workplace procedures and shut down plan
	2.4 Gas turbine plant is operated within limits of its' design, in accordance with workplace procedures during gas turbine shut down
	2.5 Gas turbine plant is inspected and monitored, in accordance with workplace procedures, to detect abnormal operating conditions during shut down
	2.6 Corrective actions are taken to rectify gas turbine plant operation abnormalities, in accordance with manufacturers' recommendations and workplace procedures

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3	**Inspect and test gas turbine plant operation during shutdown**	**3.1** Tests are performed on gas turbine plant, in accordance with workplace procedures and shut down plan
		3.2 Gas turbine system and plant is observed for correct operational response, in accordance with workplace procedures
		3.3 Corrective action is taken when operation response is not in accordance with shut down work plan, plant integrity or safety requirements
		3.4 Gas turbine plant is returned to required operational status upon completion of testing, in accordance with workplace procedures
4	**Analyse system faults during gas turbine shutdown**	**4.1** Causes of abnormal gas turbine plant operating conditions are identified, in accordance with workplace procedures, by analysing technical and operational information
		4.2 Corrective action is taken, in accordance with workplace procedures and shut down plan
		4.3 Gas turbine plant integrity and personnel safety is maintained, in accordance with workplace procedures, and through consultation with appropriate personnel and technical and operational documentation
		4.4 Appropriate personnel are notified in accordance with workplace procedures, when defects are detected
5	**Complete documentation**	**5.1** Gas turbine plant problems, movements and status are reported, in accordance with workplace procedures
		5.2 Documentation is updated, in accordance with workplace procedures

Foundation Skills

Foundation skills essential to performance are explicit in the performance criteria of this unit of competency.

Range of Conditions

Range is restricted to essential operating conditions and any other variables essential to the work environment.

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Non-essential conditions may be found in the Companion Volume Implementation Guide.

Unit Mapping Information

This unit replaces and is equivalent to UEPOPS408B Shut down a gas turbine

Links

Companion Volume implementation guides are found in VETNet - https://vetnet.gov.au/Pages/TrainingDocs.aspx?q=1715b9fa-e7bd-441c-bb8d-cf22c9c825a8

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Assessment Requirements for UEPOPS408 Shut down a gas turbine

Modification History

Release 1. This is the first release of this unit of competency in the UEP Generation Training Package.

Performance Evidence

Evidence required to demonstrate competence in this unit must be relevant to and satisfy all the requirements of the elements, performance criteria and range of conditions on at least two separate occasions and includes:

- analysing technical and operational information
- applying Work, Health and Safety (WHS)/Occupational Health and Safety (OHS) legislated requirements including:
  - emergency procedures
  - risk control measures
  - safe working practices
- communicating with personnel
- completing documentation using recording procedures
- identifying gas turbine plant status
- inspecting and testing gas turbine plant operation using diagnostic and data analysis techniques and tools to determine faults
- monitoring and operating gas turbine plant and equipment
- preparing gas turbine shut down plan
- responding to abnormal gas turbine plant operating conditions
- shutting down a gas turbine plant including planning gas turbine shut down organising resources
- using permit to work system
- working with gas turbine plant and equipment

Knowledge Evidence

Evidence required to demonstrate competence in this unit must be relevant to and satisfy all the requirements of the elements, performance criteria and range of conditions and includes knowledge of:

- fault finding techniques
- gas turbine operating parameters
- manufacturers' specifications and manuals
- permit to work system

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- principles and techniques of operation of a gas turbine and associated plant and equipment
- safety precautions associated with gas turbine shut down
- sequence of gas turbine operations
- technical and operational analysing techniques
- WHS/ OHS legislated requirements including:
  - emergency procedures
  - safe working practices
  - risk control measures
- workplace documentation
- workplace policies and procedures

Assessment Conditions

As a minimum, assessors must satisfy applicable regulatory requirements, which include requirements in the Standards for Registered Training Organisations current at the time of assessment.

As a minimum, assessment must satisfy applicable regulatory requirements, which include requirements in the Standards for Registered Training Organisations current at the time of assessment.

Assessment processes and techniques must be appropriate to the language, literacy and numeracy requirements of the work being performed and the needs of the candidate.

Assessment must occur in workplace operational situations. Where this is not appropriate, assessment must occur in simulated workplace operational situations that reflect workplace conditions.

Resources for assessment must include access to:

- a range of relevant exercises, case studies and/or other simulations
- relevant and appropriate materials, tools, equipment and personal protective equipment currently used in industry
- applicable documentation including workplace procedures, industry standards, equipment specifications, regulations, codes of practice and operation manuals.

Links

Companion Volume implementation guides are found in VETNet - https://vetnet.gov.au/Pages/TrainingDocs.aspx?q=1715b9fa-e7bd-441c-bb8d-cf22c9c825a8

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UEPOPS409 Start up a boiler unit

Modification History

Release 1. This is the first release of this unit of competency in the UEP Generation Training Package.

Application

This unit involves the skills and knowledge required to establish combustion in a boiler through to a stage at which combustion support energy is no longer necessary.

A boiler is a closed vessel in which water, under pressure, is converted into steam. Combustion is an important key to boiler operations; it occurs when oxygen combines with an element or compound to release heat.

Competency in this unit requires the ability to plan and prepare boiler unit start up, conduct boiler unit boiler unit start up, test and analyse boiler unit system faults and complete documentation. Individuals will, in general, work under supervision, in a power generation facility as an operator.

Power generation plant operators are typically trained and authorised to isolate, prepare plant and issue permits to work.

No licensing, legislative or certification requirements apply to this unit at the time of publication.

Note: Workplace practice

The application of the skills and knowledge described in this unit may require a licence or training permit to practice in the workplace where work is carried out on gas and electrical installations. Additional conditions may apply under state and territory legislative and regulatory licensing requirements.

Pre-requisite Unit

There are no prerequisite units.

Competency Field

Operations

Unit Sector

Electricity generation

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Elements and Performance Criteria

ELEMENTS	PERFORMANCE CRITERIA
Elements describe the essential outcomes.	Performance criteria describe the performance needed to demonstrate achievement of the element.
1 Plan and prepare boiler unit start up work	**1.1** Safety issues are identified in accordance with Work, Health and Safety (WHS)/Occupational Health and Safety (OHS) regulations and workplace procedures
	1.2 Work requirements are identified from appropriate personnel and documentation, in accordance with workplace procedures
	1.3 Preoperational checks are carried out on boiler unit plant, in accordance with manufacturers' recommendations and workplace procedures and site requirements
2 Conduct boiler unit start up	**2.1** Boiler auxiliary systems are started up to support boiler unit start up, in accordance with manufacturers' specifications and workplace procedures
	2.2 Pre-light up conditions for boiler unit are established, in accordance with workplace procedures
	2.3 Combustion is established with fuel consumption kept at minimum levels, in accordance with workplace procedures and manufacturers' recommendations
	2.4 Fuel, air and feed water flows are adjusted, in accordance with workplace procedures, to achieve required steam conditions and demand
	2.5 Boiler unit plant is operated within limits of its' design, in accordance with workplace procedures
	2.6 Boiler unit plant is monitored, in accordance with workplace procedures, to detect deviations from required operating conditions
	2.7 Corrective actions are taken to rectify boiler unit abnormalities, in accordance with manufacturers' recommendations and workplace procedures
3 Test boiler unit plant operation	**3.1** Tests are performed, in accordance with workplace procedures

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	3.2	Power generation system and boiler unit plant is observed, in accordance with workplace procedures, for correct operational response
	3.3	Corrective action is taken, in accordance with workplace procedures, when response does not meet documentation, plant integrity or personnel safety requirements
	3.4	Boiler unit plant is returned to required operational status upon completion of testing, in accordance with workplace procedures
4 Analyse system faults during boiler unit start up	**4.1**	Causes of abnormal boiler unit plant operating conditions are identified, in accordance with workplace procedures, by analysing technical and operational information
	4.2	Corrective action is taken, in accordance with workplace procedures
	4.3	Boiler unit plant integrity and personnel safety is maintained, in accordance with workplace procedures and through consultation with appropriate personnel and technical and operational documentation
	4.4	Appropriate personnel are notified, in accordance with workplace procedures, when defects are detected
5 Complete documentation	**5.1**	Boiler unit plant problems, movements, and status are reported, in accordance with workplace procedures
	5.2	Documentation is updated, in accordance with workplace procedures

Foundation Skills

Foundation skills essential to performance are explicit in the performance criteria of this unit of competency.

Range of Conditions

Range is restricted to essential operating conditions and any other variables essential to the work environment.

Non-essential conditions may be found in the Companion Volume Implementation Guide.

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Unit Mapping Information

This unit replaces and is equivalent to UEPOPS409B Start up a boiler unit.

Links

Companion Volume implementation guides are found in VETNet - https://vetnet.gov.au/Pages/TrainingDocs.aspx?q=1715b9fa-e7bd-441c-bb8d-cf22c9c825a8

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Assessment Requirements for UEPOPS409 Start up a boiler unit

Modification History

Release 1. This is the first release of this unit of competency in the UEP Generation Training Package.

Performance Evidence

Evidence required to demonstrate competence in this unit must be relevant to and satisfy all the requirements of the elements, performance criteria and range of conditions on at least two separate occasions and includes:

- applying Work, Health and Safety (WHS)/Occupational Health and Safety (OHS) legislated requirements including:
  - emergency procedures
  - risk control measures
  - safe working practices
- communicating with personnel
- employing temperature and pressure raising techniques
- identifying boiler unit plant status
- implementing legislation, industry standards, codes of practice and regulations
- monitoring and operating boiler unit plant and equipment
- organising resources
- planning and preparing boiler unit plant and equipment for start and run up operations
- recognising and responding to abnormal boiler unit plant operating conditions
- reviewing fuel consumption during boiler unit start up
- starting, running up and operating boiler unit and associated plant and equipment
- testing boiler unit plant operation using diagnostic and data analysis techniques and tools to determine faults
- using recording procedures to complete documentation
- working with permit to work system

Knowledge Evidence

Evidence required to demonstrate competence in this unit must be relevant to and satisfy all the requirements of the elements, performance criteria and range of conditions and includes knowledge of:

- boiler system components and interaction with other plant and equipment
- boiler unit plant and equipment, its location and operating parameters
- manufacturers' specifications and manuals
- permit to work system

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- techniques of fuel combustion
- temperature and pressure raising requirements
- typical arrangements of power production plant
- Work, Health and Safety (WHS)/Occupational Health and Safety (OHS) regulations including:
  - emergency procedures
  - risk control measures
  - safe working practices
- workplace documentation
- workplace policies and procedures

Assessment Conditions

As a minimum, assessors must satisfy applicable regulatory requirements, which include requirements in the Standards for Registered Training Organisations current at the time of assessment.

As a minimum, assessment must satisfy applicable regulatory requirements, which include requirements in the Standards for Registered Training Organisations current at the time of assessment.

Assessment processes and techniques must be appropriate to the language, literacy and numeracy requirements of the work being performed and the needs of the candidate.

Assessment must occur in workplace operational situations. Where this is not appropriate, assessment must occur in simulated workplace operational situations that reflect workplace conditions.

Resources for assessment must include access to:

- a range of relevant exercises, case studies and/or other simulations
- relevant and appropriate materials, tools, equipment and personal protective equipment currently used in industry
- applicable documentation including workplace procedures, industry standards, equipment specifications, regulations, codes of practice and operation manuals.

Links

Companion Volume implementation guides are found in VETNet - https://vetnet.gov.au/Pages/TrainingDocs.aspx?q=1715b9fa-e7bd-441c-bb8d-cf22c9c825a8

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UEPOPS410 Shut down a boiler unit

Modification History

Release 1. This is the first release of this unit of competency in the UEP Generation Training Package.

Application

This unit involves the skills and knowledge required to conduct the shutdown of a boiler unit to a depressurised state.

A shut down of a boiler unit will involve a series of steps to stop production, feed and fuel flows in a safe and controlled manner.

Competency in this unit requires the ability to plan and prepare boiler unit shut down, conduct a shut down, test boiler unit operation during shut down, analyse boiler unit system faults during shut down and completing documentation post shut down. Individuals will, in general, work under supervision in a power generation facility as an operator.

Power generation plant operators are typically trained and authorised to isolate, prepare plant and issue permits to work.

No licensing, legislative or certification requirements apply to this unit at the time of publication.

Note: Workplace practice

The application of the skills and knowledge described in this unit may require a licence or training permit to practice in the workplace where work is carried out on gas and electrical installations. Additional conditions may apply under state and territory legislative and regulatory licensing requirements.

Pre-requisite Unit

There are no prerequisite units.

Competency Field

Operations

Unit Sector

Electricity generation

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Elements and Performance Criteria

ELEMENTS	PERFORMANCE CRITERIA
Elements describe the essential outcomes.	Performance criteria describe the performance needed to demonstrate achievement of the element.
1 Plan and prepare boiler unit shut down work	**1.1** Safety issues are identified, in accordance with Work, Health and Safety (WHS)/Occupational Health and Safety (OHS) procedures and workplace procedures
	1.2 Work requirements are identified from relevant personnel and documentation, in accordance with workplace procedures
	1.3 Preoperational checks are carried out on boiler unit plant in accordance with workplace procedures, manufacturers' recommendations and workplace procedures and site requirements
2 Conduct boiler unit shut down	**2.1** Perform shut down of boiler unit, in accordance with manufacturers' specifications and workplace procedures.
	2.2 Cool down and purge boiler unit, in accordance with manufacturers' specifications and workplace procedures
	2.3 Depressurise boiler unit, in accordance with manufacturers' specifications and workplace procedures
	2.4 Corrective actions are taken to rectify boiler unit abnormalities, in accordance with manufacturers' recommendations and workplace procedures
3 Test boiler unit plant operation	**3.1** Tests are performed on boiler unit, in accordance with workplace procedures
	3.2 Power generation system and boiler unit plant is observed for correct operational response, in accordance with workplace procedures
	3.3 Corrective action is taken, in accordance with workplace procedures, when response does not meet with documentation, boiler unit plant integrity or personnel safety requirements
	3.4 Boiler unit plant is returned to required operational status upon completion of testing, in accordance with workplace procedures

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4 Analyse and report on system faults during boiler unit shut down	**4.1**	Causes of abnormal boiler unit plant operating conditions are identified by analysing technical and operational information in accordance with workplace procedures
	4.2	Corrective action is taken, in accordance with workplace procedures
	4.3	Boiler unit plant integrity and personnel safety is maintained, in accordance with workplace procedures, and through consultation with appropriate personnel, and technical and operational documentation
	4.4	Appropriate personnel are notified, in accordance with workplace procedures, when defects are detected
5 Complete documentation	**5.1**	Boiler unit plant problems, movements and status are reported, in accordance with workplace procedures
	5.2	Documentation is updated, in accordance with workplace procedures

Foundation Skills

Foundation skills essential to performance are explicit in the performance criteria of this unit of competency.

Range of Conditions

Range is restricted to essential operating conditions and any other variables essential to the work environment.

Non-essential conditions may be found in the Companion Volume Implementation Guide.

Unit Mapping Information

This unit replaces and is equivalent to UEPOPS410B Shut down a boiler unit

Links

Companion Volume implementation guides are found in VETNet - https://vetnet.gov.au/Pages/TrainingDocs.aspx?q=1715b9fa-e7bd-441c-bb8d-cf22c9c825a8

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Assessment Requirements for UEPOPS410 Shut down a boiler unit

Modification History

Release 1. This is the first release of this unit of competency in the UEP Generation Training Package.

Performance Evidence

Evidence required to demonstrate competence in this unit must be relevant to and satisfy all the requirements of the elements, performance criteria and range of conditions on at least two separate occasions and includes:

- applying Work, Health and Safety (WHS)/Occupational Health and Safety (OHS) including:
  - emergency procedures
  - risk control measures
  - safe working practices
- communicating with personnel
- identifying boiler unit plant status
- implementing legislation, industry standards, codes of practice and regulations
- monitoring and operating boiler unit plant and equipment
- organising resources
- planning shut down boiler unit plant operation
- preparing boiler unit plant and equipment for operation
- responding to abnormal boiler unit plant operating conditions
- testing boiler unit plant operation using diagnostic data analysis techniques and tools to determine faults
- using recording procedures to complete documentation
- utilising cooling and depressurising techniques
- working with permit to work system

Knowledge Evidence

Evidence required to demonstrate competence in this unit must be relevant to and satisfy all the requirements of the elements, performance criteria and range of conditions and includes knowledge of:

- boiler cooling and depressurising techniques
- boiler operational processes
- boiler system components and their interaction
- legislation, industry standards, codes of practice and regulations

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- manufacturers' specifications and manuals
- permit to work system
- typical power generation unit plant
- WHS/OHS legislation requirements including:
  - emergency procedures
  - risk control measures
  - safe working practices
- workplace documentation
- workplace policies and procedures

Assessment Conditions

As a minimum, assessors must satisfy applicable regulatory requirements, which include requirements in the Standards for Registered Training Organisations current at the time of assessment.

As a minimum, assessment must satisfy applicable regulatory requirements, which include requirements in the Standards for Registered Training Organisations current at the time of assessment.

Assessment processes and techniques must be appropriate to the language, literacy and numeracy requirements of the work being performed and the needs of the candidate.

Assessment must occur in workplace operational situations. Where this is not appropriate, assessment must occur in simulated workplace operational situations that reflect workplace conditions.

Resources for assessment must include access to:

- a range of relevant exercises, case studies and/or other simulations
- relevant and appropriate materials, tools, equipment and personal protective equipment currently used in industry
- applicable documentation including workplace procedures, industry standards, equipment specifications, regulations, codes of practice and operation manuals.

Links

Companion Volume implementation guides are found in VETNet - https://vetnet.gov.au/Pages/TrainingDocs.aspx?q=1715b9fa-e7bd-441c-bb8d-cf22c9c825a8

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UEPOPS411 Run up a steam turbine

Modification History

Release 1. This is the first release of this unit of competency in the UEP Generation Training Package.

Application

This unit involves the skills and knowledge required to conduct a steam turbine run up to a stable operating condition.

Run up of a steam turbine will involve the operator making a sequence of checks prior to and during start up. This ensures that loading the turbine is completed in a safe and consistent manner.

Competency in this unit requires the ability to plan and prepare steam turbine run up work, conduct steam turbine run up, test steam turbine and complete documentation. Individuals will, in general, work under supervision, in a power generation facility as an operator.

Power generation plant operators are typically trained and authorised to isolate, prepare plant and issue permits to work.

No licensing, legislative or certification requirements apply to this unit at the time of publication.

Note: Workplace practice

The application of the skills and knowledge described in this unit may require a licence or training permit to practice in the workplace where work is carried out on gas and electrical installations. Additional conditions may apply under state and territory legislative and regulatory licensing requirements.

Pre-requisite Unit

There are no prerequisite units.

Competency Field

Operations

Unit Sector

Electricity generation

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Elements and Performance Criteria

ELEMENTS	PERFORMANCE CRITERIA
Elements describe the essential outcomes.	Performance criteria describe the performance needed to demonstrate achievement of the element.
1 Plan and prepare steam turbine work	**1.1** Safety issues are identified, in accordance with workplace procedures and Work, Health and Safety (WHS)/Occupational Health and Safety (OHS) regulations and site requirements
	1.2 Work requirements are identified from appropriate personnel and documentation, in accordance with workplace procedures
	1.3 Preoperational checks are carried out on steam turbine plant, in accordance with manufacturers' recommendations and workplace procedures
	1.4 Turbine running up and loading schedule are ascertained from relevant documentation, in accordance with workplace procedures and site requirements
2 Take action to commence run up steam turbine	**2.1** Steam turbine and generator auxiliary systems are made available to support steam turbine run up, in accordance with manufacturers' specifications and workplace procedures
	2.2 Steam turbine plant is monitored to detect deviations from normal operating conditions
	2.3 Corrective actions are taken to rectify steam turbine abnormalities, in accordance with manufacturers' specifications and workplace procedures
	2.4 Steam generator is synchronised and connected to electrical system, in accordance with workplace procedures and manufacturers' recommendations
3 Test steam turbine plant operation	**3.1** Tests are performed, in accordance with workplace procedures
	3.2 Power generation system and steam turbine plant are observed for correct operational response, in accordance with workplace procedures
	3.3 Corrective action is taken when response does not meet documentation, steam turbine plant integrity or

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		personnel safety requirements
	3.4	Steam turbine plant is returned to required operational status upon completion of testing, in accordance with workplace procedures
4 Analyse system faults	**4.1**	Causes of abnormal steam turbine plant operating conditions are identified, in accordance with workplace procedures, by analysing technical and operational information
	4.2	Corrective action is taken, in accordance with workplace procedures
	4.3	Steam turbine plant integrity and personnel safety is maintained, in accordance with workplace procedures, through consultation with appropriate personnel and technical and operational documentation
	4.4	Appropriate personnel are notified, in accordance with workplace procedures, when defects are detected
5 Complete documentation	**5.1**	Steam turbine plant problems, movements and status are reported, in accordance with workplace procedures
	5.2	Documentation is updated, in accordance with workplace procedures

Foundation Skills

Foundation skills essential to performance are explicit in the performance criteria of this unit of competency.

Range of Conditions

Range is restricted to essential operating conditions and any other variables essential to the work environment.

Non-essential conditions may be found in the Companion Volume Implementation Guide.

Unit Mapping Information

This unit replaces and is equivalent to UEPOPS411B Run up a steam turbine.

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Links

Companion Volume implementation guides are found in VETNet - https://vetnet.gov.au/Pages/TrainingDocs.aspx?q=1715b9fa-e7bd-441c-bb8d-cf22c9c825a8

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Assessment Requirements for UEPOPS411 Run up a steam turbine

Modification History

Release 1. This is the first release of this unit of competency in the UEP Generation Training Package.

Performance Evidence

Evidence required to demonstrate competence in this unit must be relevant to and satisfy all the requirements of the elements, performance criteria and range of conditions on at least two separate occasions and includes:

- applying Work, Health and Safety (WHS)/Occupational Health and Safety (OHS) legislated requirements including:
  - emergency procedures
  - risk control measures
  - safe working procedures
- communicating with personnel
- identifying and responding to abnormal steam turbine plant operating conditions
- monitoring and operating steam turbine plant and equipment
- organise resources
- planning and preparing steam turbine operations work
- recognising steam turbine plant status
- recording procedures to complete documentation
- starting, running up and operating steam turbine and associated plant and equipment
- testing gas turbine plant operation using diagnostic and data analysis techniques and tools to determine faults
- working with permit to work system

Knowledge Evidence

Evidence required to demonstrate competence in this unit must be relevant to and satisfy all the requirements of the elements, performance criteria and range of conditions and include knowledge of:

- permit to work system
- steam turbine operating procedures and processes
- system components and their interaction with other plant and equipment including steam turbine operations
- turbine supervision and control systems
- Work, Health and Safety (WHS)/Occupational Health and Safety (OHS) legislation

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including:

- emergency procedures
- risk control measures
- safe working procedures

- workplace policies and procedures
- workplace documentation manufacturers specifications and manuals

Assessment Conditions

As a minimum, assessors must satisfy applicable regulatory requirements, which include requirements in the Standards for Registered Training Organisations current at the time of assessment.

As a minimum, assessment must satisfy applicable regulatory requirements, which include requirements in the Standards for Registered Training Organisations current at the time of assessment.

Assessment processes and techniques must be appropriate to the language, literacy and numeracy requirements of the work being performed and the needs of the candidate.

Assessment must occur in workplace operational situations. Where this is not appropriate, assessment must occur in simulated workplace operational situations that reflect workplace conditions.

Resources for assessment must include access to:

- a range of relevant exercises, case studies and/or other simulations
- relevant and appropriate materials, tools, equipment and personal protective equipment currently used in industry
- applicable documentation including workplace procedures, industry standards, equipment specifications, regulations, codes of practice and operation manuals.

Links

Companion Volume implementation guides are found in VETNet - https://vetnet.gov.au/Pages/TrainingDocs.aspx?q=1715b9fa-e7bd-441c-bb8d-cf22c9c825a8

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UEPOPS412 Undertake commissioning and decommissioning

Modification History

Release 1. This is the first release of this unit of competency in the UEP Generation Training Package.

Application

This unit involves the skills and knowledge required to undertake the commissioning and decommissioning of power generation plant and equipment.

Commissioning is a process in which installed power generating plant is tested to verify it functions according to its design specifications. Power generating plant that is shut down and dismantled is decommissioned. Commissioning and decommissioning of power generating plant does not include removal or return to service under normal or routine maintenance situations.

Competency in this unit requires the ability to plan and prepare for work, decommission plant or equipment, remove plant or equipment, recommission plant or equipment and complete work. Individuals will, in general, work as an operator, in a power generation facility.

Power generation plant operators are typically trained and authorised to isolate, prepare plant and issue permits to work.

No licensing, legislative or certification requirements apply to this unit at the time of publication.

Note: Workplace practice

The application of the skills and knowledge described in this unit may require a licence or training permit to practice in the workplace where work is carried out on gas and electrical installations. Additional conditions may apply under state and territory legislative and regulatory licensing requirements.

Pre-requisite Unit

There are no prerequisite units.

Competency Field

Operations

Unit Sector

Electricity generation

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Elements and Performance Criteria

ELEMENTS	PERFORMANCE CRITERIA
Elements describe the essential outcomes.	Performance criteria describe the performance needed to demonstrate achievement of the element.
1 Plan and prepare for work	**1.1** Work requirements are identified from work order and are confirmed with appropriate personnel or by site inspection, in accordance with workplace procedures
	1.2 Work, Health and Safety (WHS)/Occupational Health and Safety (OHS) regulations, legislative requirements, industry standards, codes of practice, manufacturers' specifications, environmental obligations and workplace procedures are identified, applied and monitored
	1.3 Resources are obtained and inspected for compliance with job specification, in accordance with workplace procedures
	1.4 Plans, drawings and manuals are selected and used, in accordance with workplace procedures
	1.5 Correct size, type and quantity of materials or components are obtained and inspected, in accordance with workplace procedures
	1.6 Work is sequenced and prioritised, in accordance with workplace procedures and site requirements
	1.7 Potential hazards are identified and risk control measures are selected and implemented, in accordance with workplace procedures
	1.8 Work area is prepared, in accordance with workplace procedures
2 Decommission plant or equipment	**2.1** Isolations are confirmed, where appropriate, in accordance with workplace procedures, site requirements and decommissioning plan
	2.2 Equipment or power generating plant is decommissioned, in accordance with workplace procedures and decommissioning plan
	2.3 Equipment or power generating plant is disconnected from energy or material sources, in accordance with workplace procedures and decommissioning plan

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3	**Remove plant or equipment**	**3.1** Isolations are confirmed, where appropriate, in accordance with workplace procedures and site requirements
		3.2 Removal of power generating plant or equipment, or dismantling of major components is carried out, in accordance with workplace procedures and decommissioning plan
		3.3 Unused electrical conductors are isolated, and are terminated, in accordance with workplace procedures and decommissioning plan
		3.4 Other sources of energy or materials are terminated and blanked, in accordance with workplace procedures and decommissioning plan
4	**Commissioning plant or equipment**	**4.1** Isolation of power generating plant is removed, in accordance with workplace procedures and site requirements
		4.2 Preoperational checks are carried out on power generating plant, in accordance with workplace procedures, manufacturers' recommendations and site requirements
		4.3 Sequence for commissioning plant are adhered to, in accordance with workplace procedures
		4.4 Power generating plant is tested for correct operation, in accordance with manufacturers' recommendations and workplace procedures
		4.5 Power generating plant or equipment performance is monitored against manufacturers' specifications, in accordance with workplace procedures, using approved methods and testing equipment
		4.6 Data is collected and referenced against manufacturers' specifications and any variances are recorded, in accordance with workplace procedures
		4.7 Power generating plant or equipment is adjusted to meet manufacturers' specifications, in accordance with workplace procedures, using approved techniques
		4.8 Final inspection is undertaken and performance data is collected, in accordance with workplace procedures, to ensure compliance with manufactures' specifications

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5 Complete work	**5.1** Work is completed and appropriate personnel are notified, in accordance with workplace procedures
	5.2 Work area is cleared of waste, cleaned, restored and secured, in accordance with worksite procedures
	5.3 Power generating plant, tools and equipment are maintained and is stored appropriately, in accordance with workplace procedures
	5.4 Work completion details are finalised, in accordance with workplace procedures

Foundation Skills

Foundation skills essential to performance are explicit in the performance criteria of this unit of competency.

Range of Conditions

Range is restricted to essential operating conditions and any other variables essential to the work environment.

Non-essential conditions may be found in the Companion Volume Implementation Guide.

Unit Mapping Information

This unit replaces and is equivalent to UEPOPS412B Undertake commissioning-decommissioning.

Links

Companion Volume implementation guides are found in VETNet - https://vetnet.gov.au/Pages/TrainingDocs.aspx?q=1715b9fa-e7bd-441c-bb8d-cf22c9c825a8

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Assessment Requirements for UEPOPS412 Undertake commissioning and decommissioning

Modification History

Release 1. This is the first release of this unit of competency in the UEP Generation Training Package.

Performance Evidence

Evidence required to demonstrate competence in this unit must be relevant to and satisfy all the requirements of the elements, performance criteria and range of conditions on at least two separate occasions and includes:

- analysing data
- applying Work, Health and Safety (WHS)/Occupational Health and Safety (OHS) requirements including:
  - emergency procedures
  - risk control measures
  - safe working practices
- commissioning plant or equipment
- communicating with personnel
- completing work interpreting manufacturers' specifications and manuals
- decommissioning power generating plant or equipment
- identifying power generating plant and equipment
- planning and preparing for work
- restarting power generating plant or equipment
- using testing and measuring equipment
- utilising isolation procedures
- utilising permit to work system
- working with decommissioning procedures for removing plant or equipment

Knowledge Evidence

Evidence required to demonstrate competence in this unit must be relevant to and satisfy all the requirements of the elements, performance criteria and range of conditions and includes knowledge of:

- data analysis
- decommission and commission of power generating plant and equipment
- isolations processes
- legislation, industry standards, codes of practice and regulations

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- manufacturers' specifications and manuals
- measurement and testing equipment
- permit to work system
- power generating plant and equipment, its location and operating parameters
- typical arrangements of power production plant
- WHS/OHS legislated requirements including:
  - emergency procedures
  - risk control measures
  - safe working practices
- workplace documentation
- workplace policies and procedures

Assessment Conditions

As a minimum, assessors must satisfy applicable regulatory requirements, which include requirements in the Standards for Registered Training Organisations current at the time of assessment.

As a minimum, assessment must satisfy applicable regulatory requirements, which include requirements in the Standards for Registered Training Organisations current at the time of assessment.

Assessment processes and techniques must be appropriate to the language, literacy and numeracy requirements of the work being performed and the needs of the candidate.

Assessment must occur in workplace operational situations. Where this is not appropriate, assessment must occur in simulated workplace operational situations that reflect workplace conditions.

Resources for assessment must include access to:

- a range of relevant exercises, case studies and/or other simulations
- relevant and appropriate materials, tools, equipment and personal protective equipment currently used in industry
- applicable documentation including workplace procedures, industry standards, equipment specifications, regulations, codes of practice and operation manuals.

Links

Companion Volume implementation guides are found in VETNet - https://vetnet.gov.au/Pages/TrainingDocs.aspx?q=1715b9fa-e7bd-441c-bb8d-cf22c9c825a8

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UEPOPS413 Coordinate operational strategies for power production

Modification History

Release 1. This is the first release of this unit of competency in the UEP Generation Training Package.

Application

This unit involves the skills and knowledge required coordinate operational strategies to achieve short and long-term goals of a power generation facility's production plant.

An operational plan describes how a power generation facility will use their resources within specified time frames. Operational strategies are the methods used to reach objectives and performance targets related to the power generation facility's operational plan.

Competency in this unit requires the ability to coordinate the implementation of operational strategies, monitor strategies and report on performance against strategies. Individuals will, in general, work as a coordinator in operational management, in a power generation facility.

No licensing, legislative or certification requirements apply to this unit at the time of publication.

Note: Workplace practice

The application of the skills and knowledge described in this unit may require a licence or training permit to practice in the workplace where work is carried out on gas and electrical installations. Additional conditions may apply under state and territory legislative and regulatory licensing requirements.

Pre-requisite Unit

There are no prerequisite units.

Competency Field

Operations

Unit Sector

Electricity generation

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Elements and Performance Criteria

ELEMENTS	PERFORMANCE CRITERIA
Elements describe the essential outcomes.	Performance criteria describe the performance needed to demonstrate achievement of the element.
1 Coordinate implementation of operational strategies	**1.1** Power generating plant operational plan and strategies are identified and implemented, in accordance with workplace procedures
	1.2 Power generating plant operations and/or condition is monitored and reported on, in accordance with workplace procedures and legislative requirements
	1.3 Resources and supplies are coordinated to meet operational plan and strategy requirements, in accordance with workplace procedures
	1.4 Authorising personnel are informed about implementation strategies, in accordance with workplace procedures
2 Monitor strategies	**2.1** Deviations from operational plan and strategies are identified and recorded, in accordance with workplace procedures
	2.2 Impact on operational strategies are identified and reviewed, in accordance with workplace procedures
	2.3 Operational strategies are monitored, in accordance with workplace procedures, legislative requirements and industry standards
3 Report performance against strategies	**3.1** Data is collected on operational strategy implementation and is processed for review, in accordance with workplace procedures
	3.2 Abnormal conditions that impact operational strategy implementation are reported, in accordance with workplace procedures
	3.3 Changes to operational strategies are documented and referred to appropriate personnel, in accordance with workplace procedures

Foundation Skills

Foundation skills essential to performance are explicit in the performance criteria of this unit of

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competency.

Range of Conditions

Range is restricted to essential operating conditions and any other variables essential to the work environment.

Non-essential conditions may be found in the Companion Volume Implementation Guide.

Unit Mapping Information

This unit replaces and is equivalent to UEPOPS413B Coordinate operational strategies for power production.

Links

Companion Volume implementation guides are found in VETNet - https://vetnet.gov.au/Pages/TrainingDocs.aspx?q=1715b9fa-e7bd-441c-bb8d-cf22c9c825a8

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Assessment Requirements for UEPOPS413 Coordinate operational strategies for power production

Modification History

Release 1. This is the first release of this unit of competency in the UEP Generation Training Package.

Performance Evidence

Evidence required to demonstrate competence in this unit must be relevant to and satisfy all the requirements of the elements, performance criteria and range of conditions on at least two separate occasions and includes:

- applying legislation, industry standards, codes of practice and regulations
- communicating with personnel
- coordinating implementation of operational strategies
- evaluating operational strategy implementation using data analysis techniques and tools
- identifying power generation plant status
- interpreting plant drawings, manufacturers' specifications and manuals
- monitoring operational strategies
- power generation plant, systems and operating parameters
- reporting on operational strategies applying Work, Health and Safety (WHS)/Occupational Health and Safety (OHS) requirements including:
- using operational plans
    - emergency procedures
    - risk control measures
    - safe working practices

Knowledge Evidence

Evidence required to demonstrate competence in this unit must be relevant to and satisfy all the requirements of the elements, performance criteria and range of conditions and includes knowledge of:

- coordination of operational strategies
- data collection and analysis techniques
- legislation, industry standards, codes of practice and regulations
- operational plans
- power generation plant and equipment, its location and operating parameters
- typical arrangements of power production plant
- WHS/OHS legislated requirements including:

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  - emergency procedures
  - risk control measures
  - safe working practices
- workplace documentation
- workplace policies and procedures

Assessment Conditions

As a minimum, assessors must satisfy applicable regulatory requirements, which include requirements in the Standards for Registered Training Organisations current at the time of assessment.

As a minimum, assessment must satisfy applicable regulatory requirements, which include requirements in the Standards for Registered Training Organisations current at the time of assessment.

Assessment processes and techniques must be appropriate to the language, literacy and numeracy requirements of the work being performed and the needs of the candidate.

Assessment must occur in workplace operational situations. Where this is not appropriate, assessment must occur in simulated workplace operational situations that reflect workplace conditions.

Resources for assessment must include access to:

- a range of relevant exercises, case studies and/or other simulations
- relevant and appropriate materials, tools, equipment and personal protective equipment currently used in industry
- applicable documentation including workplace procedures, industry standards, equipment specifications, regulations, codes of practice and operation manuals.

Links

Companion Volume implementation guides are found in VETNet - https://vetnet.gov.au/Pages/TrainingDocs.aspx?q=1715b9fa-e7bd-441c-bb8d-cf22c9c825a8

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UEPOPS414 Perform risk analysis of generation plant

Modification History

Release 1. This is the first release of this unit of competency in the UEP Generation Training Package.

Application

This unit involves the skills and knowledge required to identify and analyse risks in the loss of power generation and/or production plant.

Risk analysis identifies dangers posed by potential natural or human caused adverse events. Once risks have been identified, they must be assessed as to their potential impact and the probability of occurrence.

Competency in this unit requires the ability to identify risks; conduct analysis; produce, implement and monitor recommendations and complete documentation. Individuals will, in general, work under supervision, in a power generation facility as an operator.

Power generation plant operators are typically trained and authorised to isolate, prepare plant and issue permits to work.

No licensing, legislative or certification requirements apply to this unit at the time of publication.

Note: Workplace practice

The application of the skills and knowledge described in this unit may require a licence or training permit to practice in the workplace where work is carried out on gas and electrical installations. Additional conditions may apply under state and territory legislative and regulatory licensing requirements.

Pre-requisite Unit

There are no prerequisite units.

Competency Field

Operations

Unit Sector

Electricity generation

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Elements and Performance Criteria

ELEMENTS	PERFORMANCE CRITERIA
Elements describe the essential outcomes.	Performance criteria describe the performance needed to demonstrate achievement of the element.
1 Identify risk	**1.1** Power generation plant maintenance and operational procedures are obtained, in accordance with workplace procedures
	1.2 Power generation plant operating and maintenance history is obtained, in accordance with workplace procedures, including incident and failure reports
	1.3 Work, Health and Safety (WHS)/Occupational Health and Safety (OHS) regulations and environmental standards are researched and applied, in accordance with workplace procedures
	1.4 Power generation plant technical documentation is obtained, in accordance with workplace procedures
	1.5 Risk analysis objectives for power generation plant are defined, in accordance with workplace procedures
2 Conduct analysis	**2.1** Risk analysis is completed using approved methodology, in accordance with workplace procedures
	2.2 Power generation plant incident scenarios are identified and consequences are analysed and prioritised for risk, in accordance with workplace procedures
	2.3 Objectives identified during risk analysis for power generation plant risk scenarios are recorded, in accordance with workplace procedures
3 Produce, implement and monitor recommendations	**3.1** Recommendations for risk preventative actions are produced against each power generation plant risk scenario, as appropriate, in accordance with workplace procedures
	3.2 Implementation of recommendations for risk controls are monitored, in accordance with workplace procedures
4 Complete documentation	**4.1** Risk analysis recommendations are documented, in accordance with workplace procedures
	4.2 Risk analysis report is produced and submitted, in

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accordance with workplace procedures

Foundation Skills

Foundation skills essential to performance are explicit in the performance criteria of this unit of competency.

Range of Conditions

Range is restricted to essential operating conditions and any other variables essential to the work environment.

Non-essential conditions may be found in the Companion Volume Implementation Guide.

Unit Mapping Information

This unit replaces and is equivalent to UEPOPS414B Perform risk analysis of generation plant.

Links

Companion Volume implementation guides are found in VETNet - https://vetnet.gov.au/Pages/TrainingDocs.aspx?q=1715b9fa-e7bd-441c-bb8d-cf22c9c825a8

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Assessment Requirements for UEPOPS414 Perform risk analysis of generation plant

Modification History

Release 1. This is the first release of this unit of competency in the UEP Generation Training Package.

Performance Evidence

Evidence required to demonstrate competence in this unit must be relevant to and satisfy all the requirements of the elements, performance criteria and range of conditions on at least two separate occasions and includes:

- applying Work, Health and Safety (OHS)/Occupational Health and Safety (OHS) requirements including:
  - emergency procedures
  - risk control measures
  - safe working practices
- communicating and consulting with personnel
- completing documentation using recording procedures
- conducting risk analysis using data analysis techniques and tools
- identifying risks
- implementing legislation, industry standards, codes of practice and regulations
- interpreting manufacturers' specifications and manuals
- producing, implement and monitor risk analysis recommendations
- using power generating plant and processes
- working within power generation plant operating parameters

Knowledge Evidence

Evidence required to demonstrate competence in this unit must be relevant to and satisfy all the requirements of the elements, performance criteria and range of conditions and includes knowledge of:

- identification and implementation of risks
- legislation, industry standards, codes of practice and regulations
- manufacturers' specifications and manuals
- power generating plant and processes
- power plant and equipment, its location and operating parameters
- risk analysis methods and techniques
- risk analysis recommendations

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- typical arrangements of power production plant
- WHS/OHS legislated requirements including:
  - emergency procedures
  - safe working practices
  - risk control measures
- workplace documentation
- workplace policies and procedures

Assessment Conditions

As a minimum, assessors must satisfy applicable regulatory requirements, which include requirements in the Standards for Registered Training Organisations current at the time of assessment.

As a minimum, assessment must satisfy applicable regulatory requirements, which include requirements in the Standards for Registered Training Organisations current at the time of assessment.

Assessment processes and techniques must be appropriate to the language, literacy and numeracy requirements of the work being performed and the needs of the candidate.

Assessment must occur in workplace operational situations. Where this is not appropriate, assessment must occur in simulated workplace operational situations that reflect workplace conditions.

Resources for assessment must include access to:

- a range of relevant exercises, case studies and/or other simulations
- relevant and appropriate materials, tools, equipment and personal protective equipment currently used in industry
- applicable documentation including workplace procedures, industry standards, equipment specifications, regulations, codes of practice and operation manuals.

Links

Companion Volume implementation guides are found in VETNet - https://vetnet.gov.au/Pages/TrainingDocs.aspx?q=1715b9fa-e7bd-441c-bb8d-cf22c9c825a8

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UEPOPS416 Monitor implementation of quality control for production and maintenance

Modification History

Release 1. This is the first release of this unit of competency in the UEP Generation Training Package.

Application

This unit involves the skills and knowledge required to monitor the implementation of production and maintenance quality control procedures at a power generation facility.

Quality control is a process used to ensure variations in quality are kept to a minimum. Quality control in a power generation facility will focus on a set of processes and procedures intended to ensure that personnel, plant and equipment operate smoothly and efficiently.

Competency in this unit requires the ability to plan for quality control, monitor quality control and complete all documentation. Individuals will, in general, work as an operator, in a power generation facility.

Power generation plant operators are typically trained and authorised to isolate, prepare plant and issue permits to work.

No licensing, legislative or certification requirements apply to this unit at the time of publication.

Note: Workplace practice

The application of the skills and knowledge described in this unit may require a licence or training permit to practice in the workplace where work is carried out on gas and electrical installations. Additional conditions may apply under state and territory legislative and regulatory licensing requirements.

Pre-requisite Unit

UEPOPS337 Maintain quality systems within the team

Competency Field

Operations

Unit Sector

Electricity generation

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Elements and Performance Criteria

ELEMENTS	PERFORMANCE CRITERIA
Elements describe the essential outcomes.	Performance criteria describe the performance needed to demonstrate achievement of the element.
1 Plan for quality control	**1.1** Work, Health and Safety (WHS)/Occupational Health and Safety (OHS) standards, legislative requirements, industry standards, codes of practice, manufacturers' specifications, environmental obligations and workplace procedures are identified, applied and monitored
	1.2 Quality control parameters are established for power generation production and maintenance, in accordance with workplace procedures
	1.3 Quality control process improvement techniques are used, in accordance with workplace procedures, in the identification and resolution of quality variances in power generation
2 Monitor quality control	**2.1** Monitoring equipment is checked for correct calibration, and environmental conditions are confirmed, in accordance with workplace procedures, to ensure reliability and accuracy of test results
	2.2 Quality control procedures for production and maintenance in power generation is monitored, in accordance with workplace procedures
	2.3 Deviation and fault data is collected and reported, in accordance with workplace procedures
3 Complete documentation	**3.1** Calibration records of test equipment is maintained, in accordance with workplace procedures
	3.2 Documentation is completed, in accordance with workplace procedures

Foundation Skills

Foundation skills essential to performance are explicit in the performance criteria of this unit of competency.

Range of Conditions

Range is restricted to essential operating conditions and any other variables essential to the work

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environment.

Non-essential conditions may be found in the Companion Volume Implementation Guide.

Unit Mapping Information

This unit replaces and is equivalent to UEPOPS416B Monitor the implementation of the enterprise's production maintenance quality control procedures.

Links

Companion Volume implementation guides are found in VETNet - https://vetnet.gov.au/Pages/TrainingDocs.aspx?q=1715b9fa-e7bd-441c-bb8d-cf22c9c825a8

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Assessment Requirements for UEPOPS416 Monitor implementation of quality control for production and maintenance

Modification History

Release 1. This is the first release of this unit of competency in the UEP Generation Training Package.

Performance Evidence

Evidence required to demonstrate competence in this unit must be relevant to and satisfy all the requirements of the elements, performance criteria and range of conditions on at least two separate occasions and includes:

- applying Work, Health and Safety (WHS)/Occupational Health and Safety (OHS) requirements including:
  - emergency procedures
  - risk control measures
  - safe working practices
- communicating with personnel
- completing documentation
- conducting checks and inspections
- implementing legislation, industry standards, codes of practice and regulations
- interpreting manufacturers' specifications and manuals
- monitoring quality control processes and techniques
- planning quality control
- undertaking data analysis
- working with quality control procedures, processes and techniques

Knowledge Evidence

Evidence required to demonstrate competence in this unit must be relevant to and satisfy all the requirements of the elements, performance criteria and range of conditions and includes knowledge of:

- data analysis
- inspection techniques
- legislation, industry standards, codes of practice and regulations
- manufacturers' specifications and manuals
- power generation plant and equipment, its location and operating parameters
- quality control procedures, processes and techniques

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- typical arrangements of power production plant
- WHS/OHS legislated requirements including:
  - emergency procedures
  - risk control measures
  - safe working practices
- workplace documentation
- workplace policies and procedures

Assessment Conditions

As a minimum, assessors must satisfy applicable regulatory requirements, which include requirements in the Standards for Registered Training Organisations current at the time of assessment.

As a minimum, assessment must satisfy applicable regulatory requirements, which include requirements in the Standards for Registered Training Organisations current at the time of assessment.

Assessment processes and techniques must be appropriate to the language, literacy and numeracy requirements of the work being performed and the needs of the candidate.

Assessment must occur in workplace operational situations. Where this is not appropriate, assessment must occur in simulated workplace operational situations that reflect workplace conditions.

Resources for assessment must include access to:

- a range of relevant exercises, case studies and/or other simulations
- relevant and appropriate materials, tools, equipment and personal protective equipment currently used in industry
- applicable documentation including workplace procedures, industry standards, equipment specifications, regulations, codes of practice and operation manuals.

Links

Companion Volume implementation guides are found in VETNet - https://vetnet.gov.au/Pages/TrainingDocs.aspx?q=1715b9fa-e7bd-441c-bb8d-cf22c9c825a8

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UEPOPS417 Monitor and implement environmental site plans and procedures

Modification History

Release 1. This is the first release of this unit of competency in the UEP Generation Training Package.

Application

This unit involves the skills and knowledge required to address the monitoring and implementation of environmental plans and procedures.

Environmental planning is the process of meeting legislative and regulatory obligations, identifying risks, determining risk control strategies and responding quickly to incidents.

Competency in this unit requires the ability to plan for quality control, monitor quality control and complete all documentation. Individuals will, in general, work as an operator or technician, in a power generation facility.

Power generation plant operators are typically trained and authorised to isolate, prepare plant and issue permits to work.

No licensing, legislative or certification requirements apply to this unit at the time of publication.

Note: Workplace practice

The application of the skills and knowledge described in this unit may require a licence or training permit to practice in the workplace where work is carried out on gas and electrical installations. Additional conditions may apply under state and territory legislative and regulatory licensing requirements.

Pre-requisite Unit

There are no prerequisite units.

Competency Field

Operations

Unit Sector

Electricity generation

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Elements and Performance Criteria

ELEMENTS	PERFORMANCE CRITERIA
Elements describe the essential outcomes.	Performance criteria describe the performance needed to demonstrate achievement of the element.
1 Prepare environmental plan and procedures	**1.1** Environmental site plans and procedures are identified and examined, in accordance with site and project requirements
	1.2 Environmental risks and impacts are identified for the project, in accordance with workplace procedures
	1.3 Environmental site plans and procedures are selected, in accordance with the specific project and site requirements
2 Implement environmental plan and procedures	**2.1** Emergency procedures are implemented and environmental risks are controlled, in accordance with Work, Health and Safety (WHS)/Occupational Health and Safety (OHS) regulations and site requirements
	2.2 Environmental activities are carried out, in accordance with workplace procedures and the requirements of the environmental plan
	2.3 Environmental control procedures are implemented, and maintained and risks are mitigated, in accordance with workplace procedures and site requirements
3 Review environmental project procedures	**3.1** Environmental procedures are assessed, using feedback from stakeholders and relevant data
	3.2 Environmental procedures are reviewed and rewritten, if required, in accordance with workplace procedures
4 Control environmental incidents	**4.1** Environmental incidents are identified and controlled, in accordance with the workplace procedures and environmental plan requirements
	4.2 Environmental incidents are recorded and reported, in accordance with workplace procedures and the environmental plan requirements
5 Monitor and report on application of environmental plan and procedures	**5.1** Application of the environmental plan processes and procedures are monitored and documented, in accordance with workplace procedures

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5.2 Environmental risks and incidents are reported, in accordance with workplace procedures

5.3 Review of environmental plan is reported on, in accordance with workplace procedures

Foundation Skills

Foundation skills essential to performance are explicit in the performance criteria of this unit of competency.

Range of Conditions

Range is restricted to essential operating conditions and any other variables essential to the work environment.

Non-essential conditions may be found in the Companion Volume Implementation Guide.

Unit Mapping Information

This unit replaces and is equivalent to UEPOPS417B Monitor and implement environmental plans and procedures.

Links

Companion Volume implementation guides are found in VETNet - https://vetnet.gov.au/Pages/TrainingDocs.aspx?q=1715b9fa-e7bd-441c-bb8d-cf22c9c825a8

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Assessment Requirements for UEPOPS417 Monitor and implement environmental site plans and procedures

Modification History

Release 1. This is the first release of this unit of competency in the UEP Generation Training Package.

Performance Evidence

Evidence required to demonstrate competence in this unit must be relevant to and satisfy all the requirements of the elements, performance criteria and range of conditions on at least two separate occasions and includes:

- applying Work, Health and Safety (WHS)/Occupational Health and Safety (OHS) requirements including:
  - emergency procedures
  - risk control measures
  - safe working practices
- communicating with personnel and stakeholders
- implementing legislation, industry standards, codes of practice and regulations
- managing environmental incidents including:
  - assessing environmental risks of project including impacts
  - controlling environmental incidents
  - integrating operational activities into review of environmental procedures
  - monitoring project and environmental site
  - using risk control procedures
- monitoring and reporting on application of environmental plans and procedures
- preparing to implement environmental plan and procedures
- reviewing application of environmental plans and procedures
- working with environmental plans and procedures

Knowledge Evidence

Evidence required to demonstrate competence in this unit must be relevant to and satisfy all the requirements of the elements, performance criteria and range of conditions and includes knowledge of:

- environmental impact assessments
- environmental site plans and procedures
- identification of environmental risks and impact
- legislation, industry standards, codes of practice and regulations

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- potential incident environmental auditing
- power generation plant and equipment, its location and operating parameters
- project planning methods and techniques
- typical arrangements of power production plant
- WHS/OHS legislated requirements including:
  - emergency procedures
  - risk control measures
  - safe working practices
- workplace documentation
- workplace policies and procedures

Assessment Conditions

As a minimum, assessors must satisfy applicable regulatory requirements, which include requirements in the Standards for Registered Training Organisations current at the time of assessment.

As a minimum, assessment must satisfy applicable regulatory requirements, which include requirements in the Standards for Registered Training Organisations current at the time of assessment.

Assessment processes and techniques must be appropriate to the language, literacy and numeracy requirements of the work being performed and the needs of the candidate.

Assessment must occur in workplace operational situations. Where this is not appropriate, assessment must occur in simulated workplace operational situations that reflect workplace conditions.

Resources for assessment must include access to:

- a range of relevant exercises, case studies and/or other simulations
- relevant and appropriate materials, tools, equipment and personal protective equipment currently used in industry
- applicable documentation including workplace procedures, industry standards, equipment specifications, regulations, codes of practice and operation manuals.

Links

Companion Volume implementation guides are found in VETNet - https://vetnet.gov.au/Pages/TrainingDocs.aspx?q=1715b9fa-e7bd-441c-bb8d-cf22c9c825a8

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UEPOPS419 Shut down a steam turbine

Modification History

Release 1. This is the first release of this unit of competency in the UEP Generation Training Package.

Application

This unit involves the skills and knowledge required to conduct a shut down of a steam turbine to where it is placed at rest.

Shut down of a steam turbine will involve the operator making a sequence of checks prior to and during shutdown. This ensures that the shut down of the turbine is completed in a safe and consistent manner.

Competency in this unit requires the ability to plan and prepare steam turbine shut down, conduct a shut down, test steam turbine plant operation during shut down, analyse system faults during shut down and completing documentation. Individuals will, in general, work under supervision, in a power generation facility as an operator.

Power generation plant operators are typically trained and authorised to isolate, prepare plant and issue permits to work.

No licensing, legislative or certification requirements apply to this unit at the time of publication.

Note: Workplace practice

The application of the skills and knowledge described in this unit may require a licence or training permit to practice in the workplace where work is carried out on gas and electrical installations. Additional conditions may apply under state and territory legislative and regulatory licensing requirements.

Pre-requisite Unit

There are no prerequisite units.

Competency Field

Operations

Unit Sector

Electricity generation

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Elements and Performance Criteria

ELEMENTS	PERFORMANCE CRITERIA
Elements describe the essential outcomes.	Performance criteria describe the performance needed to demonstrate achievement of the element.
1 Plan and prepare steam turbine shut down work	**1.1** Safety issues are identified, in accordance with Work, Health and Safety (WHS)/Occupational Health and Safety (OHS) regulations, industry standards and workplace procedures
	1.2 Work requirements are identified from appropriate personnel and documentation, in accordance with workplace procedures
	1.3 Turbine shut down schedule is identified from relevant documentation, in accordance with workplace procedures and site requirements
	1.4 Pre-shut down checks are carried out on steam turbine plant, in accordance with manufacturers' recommendations and workplace procedures
2 Conduct steam turbine shutdown	**2.1** Steam turbine load is reduced, in accordance with and manufacturers' recommendations and workplace procedures
	2.2 Steam turbine and generator are removed from the steam generation system, in accordance with manufacturers' recommendations and workplace procedures
	2.3 Steam turbine is placed on turning gear, in accordance with manufacturers' recommendations and workplace procedures
	2.4 Steam turbine is cooled down on turning gear, in accordance with manufacturers recommendations and workplace procedures
3 Test steam turbine plant operation during shut down	**3.1** Tests are performed, in accordance with workplace procedures
	3.2 Steam generation system and steam turbine plant is observed, in accordance with workplace procedures, for correct operational response
	3.3 Corrective action is taken, in accordance with workplace procedures, when response does not meet

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		documentation, plant integrity or personnel safety requirements
	3.4	Steam turbine plant is returned to operational status upon completion of testing, in accordance with workplace procedures
4 Analyse and report on system faults or status during steam turbine shutdown	**4.1**	Causes of abnormal steam turbine plant operating conditions are identified, in accordance with workplace procedures, by analysing technical and operational information
	4.2	Corrective action is taken, in accordance with workplace procedures
	4.3	Steam turbine plant integrity and personnel safety is maintained, in accordance with workplace procedures, through consultation with appropriate personnel and technical and operational documentation
	4.4	Appropriate personnel are notified, in accordance with workplace procedures, when defects are detected
5 Complete documentation	**5.1**	Steam turbine plant problems, movements and status are reported, in accordance with workplace procedures
	5.2	Documentation is updated, in accordance with workplace procedures

Foundation Skills

Foundation skills essential to performance are explicit in the performance criteria of this unit of competency.

Range of Conditions

Range is restricted to essential operating conditions and any other variables essential to the work environment.

Non-essential conditions may be found in the Companion Volume Implementation Guide.

Unit Mapping Information

This unit replaces and is equivalent to UEPOPS419B Shut down a steam turbine.

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Links

Companion Volume implementation guides are found in VETNet - https://vetnet.gov.au/Pages/TrainingDocs.aspx?q=1715b9fa-e7bd-441c-bb8d-cf22c9c825a8

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Assessment Requirements for UEPOPS419 Shut down a steam turbine

Modification History

Release 1. This is the first release of this unit of competency in the UEP Generation Training Package.

Performance Evidence

Evidence required to demonstrate competence in this unit must be relevant to and satisfy all the requirements of the elements, performance criteria and range of conditions on at least two separate occasions and includes:

- applying Work, Health and Safety (WHS)/Occupational Health and Safety (OHS) regulations including:
  - emergency procedures
  - risk control measures
  - safe working practices
- communicating with personnel
- completing documentation using recording procedures
- identifying steam turbine plant status
- implementing legislation, industry standards, codes of practice and regulations
- monitoring and operating steam turbine plant and equipment
- organising resources
- recognising and responding to abnormal plant operating conditions
- shutting down steam turbine plant and equipment planning steam turbine plant work
- testing plant operationally
- testing steam turbine plant operations using diagnostic and data analysis techniques and tools to determine faults
- using steam turbine cooling techniques and procedures
- working with permit to work system

Knowledge Evidence

Evidence required to demonstrate competence in this unit must be relevant to and satisfy all the requirements of the elements, performance criteria and range of conditions and includes knowledge of:

- legislation, industry standards, codes of practice and regulations
- manufacturers' specifications and manuals
- permit to work system
- steam turbine plant and equipment, its location and operating parameters

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- steam turbine system components and their interaction with other power generation plant and equipment
- turbine operations
- typical arrangements of power production plant
- Work, Health and Safety (WHS)/Occupational Health and Safety (OHS) legislation including:
  - emergency procedures
  - risk control measures
  - safe working procedures
- workplace documentation
- workplace policies and procedures

Assessment Conditions

As a minimum, assessors must satisfy applicable regulatory requirements, which include requirements in the Standards for Registered Training Organisations current at the time of assessment.

As a minimum, assessment must satisfy applicable regulatory requirements, which include requirements in the Standards for Registered Training Organisations current at the time of assessment.

Assessment processes and techniques must be appropriate to the language, literacy and numeracy requirements of the work being performed and the needs of the candidate.

Assessment must occur in workplace operational situations. Where this is not appropriate, assessment must occur in simulated workplace operational situations that reflect workplace conditions.

Resources for assessment must include access to:

- a range of relevant exercises, case studies and/or other simulations
- relevant and appropriate materials, tools, equipment and personal protective equipment currently used in industry
- applicable documentation including workplace procedures, industry standards, equipment specifications, regulations, codes of practice and operation manuals.

Links

Companion Volume implementation guides are found in VETNet - https://vetnet.gov.au/Pages/TrainingDocs.aspx?q=1715b9fa-e7bd-441c-bb8d-cf22c9c825a8

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UEPOPS420 Coordinate network/system

Modification History

Release 1. This is the first release of this unit of competency in the UEP Generation Training Package.

Application

This unit involves the skills and knowledge required for the coordination of a network and/or system. Networks and/or systems may be interconnected, remote or isolated.

Power generation operators will typically manage varying levels of network and/or system complexity across facilities, as well as the networks and/or systems that exist within an individual facility's plant and equipment.

Competency in this unit requires the ability to plan network and/or system operations, coordinate network and/or system, respond to network and/or system faults or incidents and complete all documentation. Individuals will, in general, work as an operator with coordination responsibilities in network and/or system control in a power generation facility.

Power generation plant operators are typically trained and authorised to isolate, prepare plant and issue permits to work.

No licensing, legislative or certification requirements apply to this unit at the time of publication.

Note: Workplace practice

The application of the skills and knowledge described in this unit may require a licence or training permit to practice in the workplace where work is carried out on gas and electrical installations. Additional conditions may apply under state and territory legislative and regulatory licensing requirements.

Pre-requisite Unit

There are no prerequisite units.

Competency Field

Operations

Unit Sector

Electricity generation

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Elements and Performance Criteria

ELEMENTS	PERFORMANCE CRITERIA
Elements describe the essential outcomes.	Performance criteria describe the performance needed to demonstrate achievement of the element.
1 Plan and prepare network/system operations	**1.1** Information and documentation is identified, assessed and evaluated, in accordance with workplace procedures and network and/or system requirements
	1.2 Network and/or system and associated equipment operational prerequisites are determined, in accordance with workplace procedures
	1.3 Work priorities are determined to suit network and/or system circumstances, in accordance with workplace procedures
	1.4 Network and/or system limitations and performance are identified, in accordance with workplace procedures
2 Coordinate network/ system	**2.1** Network and/or system is operated, in accordance with workplace procedures
	2.2 Network and/or system demand is monitored, in accordance with workplace procedures to ensure the quality of supply and to maintain stability and system integrity
	2.3 Network and/or system load shedding sequence and priorities are monitored, in accordance with workplace procedures
	2.4 Network and/or system corrective actions to rectify deviations are implemented, in accordance with workplace procedures, following analysis of data
	2.5 Resources to meet network and/or system requirements are identified and coordinated, in accordance with workplace procedures
	2.6 Network and/or system operations are carried out, in accordance with workplace procedures and in consultation with team members
3 Respond to network/system faults	**3.1** Causes of abnormal network and/or system operating conditions are identified, in accordance with workplace procedures and technical and operational information

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	3.2	Operation of protection for network and/or system is identified and assessed, in accordance with workplace procedures, to evaluate the nature and cause of fault conditions
	3.3	Communication is established with key stakeholders, in accordance with workplace procedures to identify the nature and source of network system interference
	3.4	Corrective action is taken, in accordance with workplace procedures
	3.5	Network and/or system integrity and safety are maintained, in accordance with workplace procedures, through consultation with personnel and reference to technical and operational documentation including contingency plans
4 Complete documentation	**4.1**	Network and/or system problems, movements and status is reported, in accordance with workplace procedures
	4.2	Documentation is updated, in accordance with workplace procedures

Foundation Skills

Foundation skills essential to performance are explicit in the performance criteria of this unit of competency.

Range of Conditions

Range is restricted to essential operating conditions and any other variables essential to the work environment.

Non-essential conditions may be found in the Companion Volume Implementation Guide.

Unit Mapping Information

This unit replaces and is equivalent to UEPOPS420B Coordinate the network/system.

Links

Companion Volume implementation guides are found in VETNet - https://vetnet.gov.au/Pages/TrainingDocs.aspx?q=1715b9fa-e7bd-441c-bb8d-cf22c9c825a8

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Assessment Requirements for UEPOPS420 Coordinate network/system

Modification History

Release 1. This is the first release of this unit of competency in the UEP Generation Training Package.

Performance Evidence

Evidence required to demonstrate competence in this unit must be relevant to and satisfy all the requirements of the elements, performance criteria and range of conditions on at least two separate occasions and includes:

- applying Work, Health and Safety (WHS)/Occupational Health and Safety (OHS) requirements including:
  - emergency procedures
  - risk control measures
  - safe working practices
- communicating with external agencies
- communicating with personnel
- completing documentation using recording procedures
- coordinating and controlling network and/or system to maintain power generating plant integrity
- coordinating personnel
- diagnosing continuity of supply for optimum efficiency
- identifying power generating plant status
- implementing legislation, industry standards, codes of practice and regulations
- interpreting plant drawings, manufacturers' specifications and manuals
- planning and preparing network and/or system operations
- recognising and responding to network system faults and abnormal operating conditions
- selecting appropriate load shedding
- using contingency plans

Knowledge Evidence

Evidence required to demonstrate competence in this unit must be relevant to and satisfy all the requirements of the elements, performance criteria and range of conditions and includes knowledge of:

- coordination of a network and/or system operation
- legislation, industry standards, codes of practice and regulations
- network and/or system faults and abnormal system operating condition

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- network and/or system types and characteristics
- plant drawings, manufacturers' specifications and manuals
- power generating plant and equipment, its location and operating parameters
- power generating plant status
- typical arrangements of power production plant
- WHS/OHS legislated requirements including:
  - emergency procedures
  - risk control measures
  - safe working practices
- workplace documentation
- workplace policies and procedures

Assessment Conditions

As a minimum, assessors must satisfy applicable regulatory requirements, which include requirements in the Standards for Registered Training Organisations current at the time of assessment.

As a minimum, assessment must satisfy applicable regulatory requirements, which include requirements in the Standards for Registered Training Organisations current at the time of assessment.

Assessment processes and techniques must be appropriate to the language, literacy and numeracy requirements of the work being performed and the needs of the candidate.

Assessment must occur in workplace operational situations. Where this is not appropriate, assessment must occur in simulated workplace operational situations that reflect workplace conditions.

Resources for assessment must include access to:

- a range of relevant exercises, case studies and/or other simulations
- relevant and appropriate materials, tools, equipment and personal protective equipment currently used in industry
- applicable documentation including workplace procedures, industry standards, equipment specifications, regulations, codes of practice and operation manuals.

Links

Companion Volume implementation guides are found in VETNet - https://vetnet.gov.au/Pages/TrainingDocs.aspx?q=1715b9fa-e7bd-441c-bb8d-cf22c9c825a8

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UEPOPS422 Schedule generation

Modification History

Release 1. This is the first release of this unit of competency in the UEP Generation Training Package.

Application

This unit involves the skills and knowledge required to undertake the scheduling of generation plant to meet forecast demand.

Scheduling is the process of optimising plant operations in the power generation process. The aim is to enhance overall energy delivery over different planning and time horizons.

Competency in this unit requires the ability to forecast from market data, identify generation unit availability and capability, prepare generation unit schedules and implement generation unit schedules. Individuals will, in general, work under supervision, in a power generation facility as an operator with responsibility for scheduling. Power generation plant operators are typically trained and authorised to isolate, prepare plant and issue permits to work.

No licensing, legislative or certification requirements apply to this unit at the time of publication.

Note: Workplace practice

The application of the skills and knowledge described in this unit may require a licence or training permit to practice in the workplace where work is carried out on gas and electrical installations. Additional conditions may apply under state and territory legislative and regulatory licensing requirements.

Pre-requisite Unit

There are no prerequisite units.

Competency Field

Operations

Unit Sector

Electricity generation

Elements and Performance Criteria

ELEMENTS **PERFORMANCE CRITERIA**

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Elements describe the essential outcomes.	Performance criteria describe the performance needed to demonstrate achievement of the element.
1 Forecast from market data	**1.1** Information on all variables which have the potential to affect generation demand is obtained and employed, in accordance with workplace procedures, to enable a forecast
	1.2 Forecast prediction is based on the interpretation of relevant information, in accordance with workplace procedures
	1.3 Forecast outcomes are produced in a time frame that enables electricity system security and operational criteria to be maintained, in accordance with workplace procedures
	1.4 Forecast prediction is continuously assessed, in accordance with workplace procedures, against real time trends and adjustments are made
2 Identify unit availability and capability	**2.1** Information integrity is confirmed, in accordance with workplace procedures, and deficiencies are detected and rectified
	2.2 Information is processed and recorded, in accordance with workplace procedures, in a time frame that enables scheduling to take place
	2.3 Information on all factors which have the potential to affect generation unit status is obtained, in accordance with workplace procedures
	2.4 Communication is maintained with remote and independent power generators, in accordance with workplace procedures
	2.5 Power generation plant maintenance commitments are incorporated into setting priorities for committing generation units scheduling, in accordance with workplace procedures
	2.6 Generation plant testing commitments are incorporated into setting scheduling priorities, in accordance with workplace procedures for committing units
	2.7 Power station generation plant problems are accurately assessed, in accordance with workplace procedures, for impact on generation unit commitments and scheduling

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		requirements
3 Prepare generation unit schedules	**3.1**	Base load generation is scheduled, in accordance with workplace procedures and contractual obligations
	3.2	Electricity system security criteria is applied and met, in accordance with workplace procedures
	3.3	Schedule is produced and applied, in accordance with workplace procedures, to allow for power generation plant movements to occur within required timeframes
4 Implement generation unit schedules	**4.1**	Circumstances resulting in unexpected changes to demand are identified and managed, in accordance with workplace procedures and electricity system requirements
	4.2	Transmission system losses are identified and minimised, in accordance with workplace procedures and electricity system requirements
	4.3	Transmission and generation system status changes are identified and accommodated, in accordance with workplace procedures and electricity system requirements
	4.4	Fuel supply status changes are identified and accommodated, in accordance with workplace procedures and electricity system requirements
	4.5	Generation outputs are monitored, in accordance with workplace procedures and electricity system requirements
	4.6	Power generation plant problems are assessed, in accordance with workplace procedures, and impact on generation unit scheduling and electricity system requirements
	4.7	Electricity system fault levels and transmission plant load levels are identified and not exceeded, in accordance with workplace procedures and electricity system requirements
	4.8	Scheduling of generation units is timed to optimise electricity system efficiency, in accordance with workplace procedures
	4.9	Scheduling information is recorded and communicated to all stakeholders, in accordance with workplace

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procedures and electricity system requirements

Foundation Skills

Foundation skills essential to performance are explicit in the performance criteria of this unit of competency.

Range of Conditions

Range is restricted to essential operating conditions and any other variables essential to the work environment.

Non-essential conditions may be found in the Companion Volume Implementation Guide.

Unit Mapping Information

This unit replaces and is equivalent to UEPOPS422B Schedule generation.

Links

Companion Volume implementation guides are found in VETNet - https://vetnet.gov.au/Pages/TrainingDocs.aspx?q=1715b9fa-e7bd-441c-bb8d-cf22c9c825a8

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Assessment Requirements for UEPOPS422 Schedule generation

Modification History

Release 1. This is the first release of this unit of competency in the UEP Generation Training Package.

Performance Evidence

Evidence required to demonstrate competence in this unit must be relevant to and satisfy all the requirements of the elements, performance criteria and range of conditions on at least two separate occasions and includes:

- applying Work, Health and Safety (WHS)/Occupational Health and Safety (OHS) requirements including:
  - emergency procedures
  - risk control measures
  - safety working practices
- communicating with personnel
- distinguishing power generation plant status
- forecasting load profiles
- identifying scheduling plant to meet demand
- implementing legislation, industry standards, codes of practice and regulations
- preparing and implementing generation schedules
- recognising generation unit status including availability and capability
- scheduling generating units to maintain optimum electricity system efficiency
- using data analysis techniques and tools

Knowledge Evidence

Evidence required to demonstrate competence in this unit must be relevant to and satisfy all the requirements of the elements, performance criteria and range of conditions and includes knowledge of:

- electricity system operating instructions
- generation schedules
- generation unit status
- legislation, industry standards, codes of practice and regulations
- load profile forecasting
- operating criteria including fuel strategies
- operation and loading characteristics of generation plant
- power generation plant status
- schedule techniques

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- scheduling plant and equipment, its location and operating parameters
- typical arrangements of power production plant including operating parameters
- WHS/OHS legislated requirements including:
  - emergency procedures
  - safety working practices and procedures
  - risk control measures
- workplace documentation
- workplace policies and procedures

Assessment Conditions

As a minimum, assessors must satisfy applicable regulatory requirements, which include requirements in the Standards for Registered Training Organisations current at the time of assessment.

As a minimum, assessment must satisfy applicable regulatory requirements, which include requirements in the Standards for Registered Training Organisations current at the time of assessment.

Assessment processes and techniques must be appropriate to the language, literacy and numeracy requirements of the work being performed and the needs of the candidate.

Assessment must occur in workplace operational situations. Where this is not appropriate, assessment must occur in simulated workplace operational situations that reflect workplace conditions.

Resources for assessment must include access to:

- a range of relevant exercises, case studies and/or other simulations
- relevant and appropriate materials, tools, equipment and personal protective equipment currently used in industry
- applicable documentation including workplace procedures, industry standards, equipment specifications, regulations, codes of practice and operation manuals.

Links

Companion Volume implementation guides are found in VETNet - https://vetnet.gov.au/Pages/TrainingDocs.aspx?q=1715b9fa-e7bd-441c-bb8d-cf22c9c825a8

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UEPOPS423 Plan a scheduled outage

Modification History

Release 1. This is the first release of this unit of competency in the UEP Generation Training Package.

Application

This unit involves the skills and knowledge required to plan for a scheduled outage of power generating plant.

A schedule is a plan of action detailing a series of tasks to be undertaken at or during a specified time. A forced outage is the shutdown of generation facility, transmission or distribution line when a generating unit is unavailable to produce power due to an unexpected breakdown.

Competency in this unit requires the ability to identify outage requirements, create outage plans, implement outage plans and complete documentation. Individuals will, in general, work as an operator with responsibility for quality control, in a power generation facility.

Power generation plant operators are typically trained and authorised to isolate, prepare plant and issue permits to work.

No licensing, legislative or certification requirements apply to this unit at the time of publication.

Note: Workplace practice

The application of the skills and knowledge described in this unit may require a licence or training permit to practice in the workplace where work is carried out on gas and electrical installations. Additional conditions may apply under state and territory legislative and regulatory licensing requirements.

Pre-requisite Unit

There are no prerequisite units.

Competency Field

Operations

Unit Sector

Electricity generation

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Elements and Performance Criteria

ELEMENTS	PERFORMANCE CRITERIA
Elements describe the essential outcomes.	Performance criteria describe the performance needed to demonstrate achievement of the element.
1 Identify outage requirements	**1.1** Outage requirements are identified from work orders and is clarified with the appropriate personnel or site inspection, in accordance with workplace procedures
	1.2 Safety issues are identified, in accordance with Work, Health and Safety (WHS)/Occupational Health and Safety (OHS) and legislative requirements, industry standards and workplace procedures
	1.3 Date, time and expected duration of outage is assessed and confirmed from relevant information and statistical records in accordance with workplace procedures
	1.4 Schematic diagrams, drawings, plans or maps are consulted to determine area affected by outage, in accordance with workplace procedures
2 Create outage plan	**2.1** Impact of outage is ascertained, in accordance with workplace procedures
	2.2 Key stakeholders and/or equipment affected by outage are identified, in accordance with workplace procedures
	2.3 Status of plant and consumers affected by outage is identified and assessed, in accordance with workplace procedures
	2.4 Key stakeholders are consulted to determine timetable and contingency plan, in accordance with workplace procedures
	2.5 Disruptions to key consumers are minimised, in accordance with workplace procedures, by providing alternative routes of power generation supply
	2.6 Scope of work to be carried out during outage is evaluated against allocated timeframes, in accordance with workplace procedures
	2.7 Work permits required prior to and during outage are obtained, in accordance with workplace procedures

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3 Implement outage plan	**3.1**	Work crews are notified of outage plan through the appropriate channels, in accordance with workplace procedures
	3.2	Notification of outage is communicated to all stakeholders, in accordance with workplace procedures
4 Complete documentation	**4.1**	Records are maintained, in accordance with workplace procedures
	4.2	Documentation is updated, in accordance with workplace procedures

Foundation Skills

Foundation skills essential to performance are explicit in the performance criteria of this unit of competency.

Range of Conditions

Range is restricted to essential operating conditions and any other variables essential to the work environment.

Non-essential conditions may be found in the Companion Volume Implementation Guide.

Unit Mapping Information

This unit replaces and is equivalent to UEPOPS423B Plan a scheduled outage.

Links

Companion Volume implementation guides are found in VETNet - https://vetnet.gov.au/Pages/TrainingDocs.aspx?q=1715b9fa-e7bd-441c-bb8d-cf22c9c825a8

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Assessment Requirements for UEPOPS423 Plan a scheduled outage

Modification History

Release 1. This is the first release of this unit of competency in the UEP Generation Training Package.

Performance Evidence

Evidence required to demonstrate competence in this unit must be relevant to and satisfy all the requirements of the elements, performance criteria and range of conditions on at least two separate occasions and includes:

- advising and communicating with key stakeholders
- applying Work, Health and Safety (WHS)/Occupational Health and Safety (OHS) legislated requirements including:
  - emergency procedures
  - risk control measures
  - safe working practices
- communicating with personnel
- creating outage plans
- identifying outage requirements
- implementing legislation, industry standards, codes of practice and regulations
- interpreting manufacturers' specifications and manuals
- investigating implications of outage
- planning outage work
- recognising power generation plant status
- using documenting and recording procedures
- working with permit to work system

Knowledge Evidence

Evidence required to demonstrate competence in this unit must be relevant to and satisfy all the requirements of the elements, performance criteria and range of conditions and includes knowledge of:

- communication and liaison techniques
- legislation, industry standards, codes of practices and regulations
- manufacturers' specifications and manuals
- outages and potential impact
- permit to work system

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- power generation plant and equipment, its location and operating parameters
- power generation plant status
- scheduling methods and tools
- stakeholders
- types of schedules
- typical arrangements of power generation plant
- WHS/OHS policy and procedures including:
  - emergency procedures
  - risk control measures
  - safe working practices
- workplace documentation
- workplace policies and procedures

Assessment Conditions

As a minimum, assessors must satisfy applicable regulatory requirements, which include requirements in the Standards for Registered Training Organisations current at the time of assessment.

As a minimum, assessment must satisfy applicable regulatory requirements, which include requirements in the Standards for Registered Training Organisations current at the time of assessment.

Assessment processes and techniques must be appropriate to the language, literacy and numeracy requirements of the work being performed and the needs of the candidate.

Assessment must occur in workplace operational situations. Where this is not appropriate, assessment must occur in simulated workplace operational situations that reflect workplace conditions.

Resources for assessment must include access to:

- a range of relevant exercises, case studies and/or other simulations
- relevant and appropriate materials, tools, equipment and personal protective equipment currently used in industry
- applicable documentation including workplace procedures, industry standards, equipment specifications, regulations, codes of practice and operation manuals.

Links

Companion Volume implementation guides are found in VETNet - https://vetnet.gov.au/Pages/TrainingDocs.aspx?q=1715b9fa-e7bd-441c-bb8d-cf22c9c825a8

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UEPOPS424 Coordinate local H.V. networks

Modification History

Release 1. This is the first release of this unit of competency in the UEP Generation Training Package.

Application

This unit involves the skills and knowledge required to coordinate the control and management of High Voltage (H.V.) substations and/or local networks.

H.V. substations are a node point in power generation infrastructure. They transform voltage from high to low, or the reverse, and enable the reliable transmission of large amounts of power.

Competency in this unit requires the ability to plan and prepare work; operate, monitor and control H.V. substation and local network; analyse and respond to H.V. substation or local network faults or incidents; review incident response and preventative procedures and complete all documentation. Individuals will, in general, work as an operator with responsibility for H.V. network coordination, in a power generation facility.

Power generation plant operators are typically trained and authorised to isolate, prepare plant and issue permits to work.

No licensing, legislative or certification requirements apply to this unit at the time of publication.

Note: Workplace practice

The application of the skills and knowledge described in this unit may require a licence or training permit to practice in the workplace where work is carried out on gas and electrical installations. Additional conditions may apply under state and territory legislative and regulatory licensing requirements.

Pre-requisite Unit

There are no prerequisite units.

Competency Field

Operations

Unit Sector

Electricity generation

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Elements and Performance Criteria

ELEMENTS	PERFORMANCE CRITERIA
Elements describe the essential outcomes.	Performance criteria describe the performance needed to demonstrate achievement of the element.
1 Plan and prepare work	**1.1** Documentation to determine High Voltage (H.V.) substation and/or local network status is assessed and evaluated, in accordance with workplace procedures
	1.2 H.V. substation or local network equipment operational prerequisites are established, in accordance with manufacturers' requirements and workplace procedures
	1.3 Sequence for operating local network section and equipment is determined, in accordance with workplace procedures and site requirements
	1.4 Information to forecast and plan response for efficient operation of H.V substation or local network is utilised, in accordance with workplace procedures
	1.5 Regular consultation with key stakeholders is maintained, in accordance with workplace procedures
	1.6 Implications of operator's actions to H.V substation or local network are identified and assessed, in accordance with workplace procedures
2 Operate, monitor and control H.V. substation and local network	**2.1** Local network is operated and coordinated, in accordance with workplace procedures
	2.2 Local network voltage and current requirements are assessed and evaluated, in accordance with workplace procedures, to maintain stability and system integrity
	2.3 Voltage and/or load profiles are identified and adhered to, in accordance with workplace procedures
	2.4 Corrective actions to rectify H.V. substation or local network abnormalities are implemented following analysis of data, in accordance with manufacturers' requirements and workplace procedures
	2.5 Resources are identified and coordinated to meet H.V. substation or local network system requirements, in accordance with workplace procedures

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3	**Analyse and respond to H.V. substation and local network faults or incidents**	**3.1** Cause of H.V. substation or local network fault conditions are identified, in accordance with workplace procedures, by analysing technical and operational information in consultation with system control personnel
		3.2 Operation of protection systems for H.V. substation or local network is identified and assessed, in accordance with workplace procedures, to evaluate nature and cause of fault conditions
		3.3 Communication is established with key stakeholders, in accordance with workplace procedures, to identify nature or source of H.V. substation or local network system interference
		3.4 Corrective action is taken, in accordance with workplace procedures
		3.5 Local system integrity and personnel safety are maintained, in accordance with workplace procedures, through consultation with appropriate personnel and operational documentation and contingency plans
4	**Review incident response and preventative procedures**	**4.1** Incident or fault responses are assessed and reviewed, in accordance with workplace procedures
		4.2 Alternative responses or contingency plan strategies are identified and assessed, in accordance with workplace procedures
		4.3 Alternative responses or contingency plan strategies are documented and approved, in accordance with workplace procedures
5	**Complete documentation**	**5.1** H.V. substation or local network problems, movements and status are reported, in accordance with workplace procedures
		5.2 Documentation is updated, in accordance with workplace procedures

Foundation Skills

Foundation skills essential to performance are explicit in the performance criteria of this unit of competency.

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Range of Conditions

Range is restricted to essential operating conditions and any other variables essential to the work environment.

Non-essential conditions may be found in the Companion Volume Implementation Guide.

Unit Mapping Information

This unit replaces and is equivalent to UEPOPS424B Coordinate local H.V. networks.

Links

Companion Volume implementation guides are found in VETNet - https://vetnet.gov.au/Pages/TrainingDocs.aspx?q=1715b9fa-e7bd-441c-bb8d-cf22c9c825a8

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Assessment Requirements for UEPOPS424 Coordinate local H.V. networks

Modification History

Release 1. This is the first release of this unit of competency in the UEP Generation Training Package.

Performance Evidence

Evidence required to demonstrate competence in this unit must be relevant to and satisfy all the requirements of the elements, performance criteria and range of conditions on at least two separate occasions and includes:

- analysing and responding to H.V. substation and/or local network faults or incidents
- applying Work, Health and Safety (WHS)/Occupational Health and Safety (OHS) requirements including:
  - emergency procedures
  - risk control measures
  - safe working practices
- communicating with key stakeholders
- communicating with personnel and external agencies
- completing documentation using recording procedures
- identifying power generation plant status
- implementing legislation, industry standards, codes of practice and regulations
- interpreting manufacturers' specifications and manuals
- operating, monitoring and controlling local High Voltage (H.V.) substation and/or local network
- preparing for H.V. network system operations
- recognising and responding to abnormal H.V. substations and local network operating conditions using data analysis techniques and tools
- reviewing incident response and preventative procedures
- using contingency plans

Knowledge Evidence

Evidence required to demonstrate competence in this unit must be relevant to and satisfy all the requirements of the elements, performance criteria and range of conditions and includes knowledge of:

- abnormal operating conditions in H.V substations and local networks
- contingency plans
- coordination of H.V substations and local networks

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- H.V substations and local network types and characteristics
- legislation, industry standards, codes of practice and regulations
- manufacturers' specifications and manuals
- power generating plant and equipment, its location and operating parameters
- power generating plant status
- typical arrangements of power production plant
- WHS/OHS legislated requirements including:
  - emergency procedures
  - risk control measures
  - safe working practices
- workplace documentation
- workplace policies and procedures

Assessment Conditions

As a minimum, assessors must satisfy applicable regulatory requirements, which include requirements in the Standards for Registered Training Organisations current at the time of assessment.

As a minimum, assessment must satisfy applicable regulatory requirements, which include requirements in the Standards for Registered Training Organisations current at the time of assessment.

Assessment processes and techniques must be appropriate to the language, literacy and numeracy requirements of the work being performed and the needs of the candidate.

Assessment must occur in workplace operational situations. Where this is not appropriate, assessment must occur in simulated workplace operational situations that reflect workplace conditions.

Resources for assessment must include access to:

- a range of relevant exercises, case studies and/or other simulations
- relevant and appropriate materials, tools, equipment and personal protective equipment currently used in industry
- applicable documentation including workplace procedures, industry standards, equipment specifications, regulations, codes of practice and operation manuals.

Links

Companion Volume implementation guides are found in VETNet - https://vetnet.gov.au/Pages/TrainingDocs.aspx?q=1715b9fa-e7bd-441c-bb8d-cf22c9c825a8

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UEPOPS425 Produce maintenance plans for generation production plant

Modification History

Release 1. This is the first release of this unit of competency in the UEP Generation Training Package.

Application

This unit involves the skills and knowledge required to undertake the establishment and implementation of maintenance plans for generation production plant. Power generation production plant can include boilers, turbines, hydro equipment and systems, electrical components and systems, control and monitoring systems, ash and dust systems, water treatment and fuel equipment.

A maintenance plan details the actions to maintain and improve the condition of power generating plant. It involves the inspection, servicing, repairing or replacing of the physical components of machines, plant and equipment.

Competency in this unit requires the ability to research and plan for maintenance, develop maintenance plans and implementing and monitoring maintenance plans. Individuals will, in general, work under supervision, in a power generation facility as an operator with responsibility for maintenance planning.

No licensing, legislative or certification requirements apply to this unit at the time of publication.

Note: Workplace practice

The application of the skills and knowledge described in this unit may require a licence or training permit to practice in the workplace where work is carried out on gas and electrical installations. Additional conditions may apply under state and territory legislative and regulatory licensing requirements.

Pre-requisite Unit

There are no prerequisite units.

Competency Field

Operations

Unit Sector

Electricity generation

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Elements and Performance Criteria

ELEMENTS	PERFORMANCE CRITERIA
Elements describe the essential outcomes.	Performance criteria describe the performance needed to demonstrate achievement of the element.
1 Research and plan for maintenance	**1.1** Work requirements are identified and confirmed with appropriate personnel or by site inspection, in accordance with workplace procedures
	1.2 Work, Health and Safety (WHS)/Occupational Health and Safety (OHS) regulations, legislative requirements, industry standards, codes of practice, manufacturers' specifications, environmental obligations and workplace procedures are identified, applied and monitored
	1.3 Resources for maintenance planning are obtained, in accordance with workplace procedures
	1.4 Relevant plans, drawings and manuals are selected and used, in accordance with workplace procedures
	1.5 Maintenance is sequenced and prioritised, in accordance with workplace procedures and site requirements
	1.6 Potential hazards are identified and risk control measures are selected and implemented, in accordance with workplace procedures
	1.7 Generation production plant maintenance history including condition monitoring information, recent modifications and existing status are identified and addressed in the maintenance plan, in accordance with workplace procedures
	1.8 Costing of maintenance work is undertaken, and impact on budget is assessed, in accordance with workplace procedures
	1.9 Need for operational testing or generation production plant recommissioning is identified, in accordance with workplace procedures
2 Develop maintenance plan	**2.1** Maintenance schedule is placed into the maintenance plan, in accordance with workplace procedures
	2.2 Generation production plant isolation and access requests are documented, in accordance with workplace

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		procedures
	2.3	Availability of resources is confirmed and documented, in accordance with workplace procedures
	2.4	Information relevant to work activities, including risk management and quality control, is attached to maintenance plan, in accordance with workplace procedures
	2.5	Maintenance plan is distributed to personnel, in accordance with workplace procedures
	2.6	Maintenance methods are documented as part of the maintenance plan and are presented for review to appropriate personnel, in accordance with workplace procedures
3 Implement and monitor maintenance plan	**3.1**	Maintenance plan is implemented, in accordance with workplace procedures
	3.2	Feedback on maintenance plan is sought, in accordance with workplace procedures
	3.3	Maintenance plan is modified and approved, in accordance with workplace procedures
	3.4	Amended maintenance plan is distributed to appropriate personnel, in accordance with workplace procedures

Foundation Skills

Foundation skills essential to performance are explicit in the performance criteria of this unit of competency.

Range of Conditions

Range is restricted to essential operating conditions and any other variables essential to the work environment.

Non-essential conditions may be found in the Companion Volume Implementation Guide.

Unit Mapping Information

This unit replaces and is equivalent to UEPOPS425B Produce maintenance plans for generation production plant.

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Links

Companion Volume implementation guides are found in VETNet - https://vetnet.gov.au/Pages/TrainingDocs.aspx?q=1715b9fa-e7bd-441c-bb8d-cf22c9c825a8

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Assessment Requirements for UEPOPS425 Produce maintenance plans for generation production plant

Modification History

Release 1. This is the first release of this unit of competency in the UEP Generation Training Package.

Performance Evidence

Evidence required to demonstrate competence in this unit must be relevant to and satisfy all the requirements of the elements, performance criteria and range of conditions on at least two separate occasions and includes:

- applying Work, Health and Safety (OHS)/Occupational Health and Safety (OHS) requirements including:
  - emergency procedures
  - risk control measures
  - safe working practices
- analysing information using data analysis techniques and tools
- communicating with personnel
- determining legislation, industry standards, codes of practice and regulations
- developing maintenance plan
- disseminating maintenance plan
- documenting maintenance methods
- identifying risk management and quality control information and procedures
- implementing and monitoring maintenance plan
- producing maintenance plans
- recognising maintenance requirements by applying maintenance planning principles
- researching and planning for maintenance
- using manufacturers' specifications and manuals

Knowledge Evidence

Evidence required to demonstrate competence in this unit must be relevant to and satisfy all the requirements of the elements, performance criteria and range of conditions and includes knowledge of:

- dissemination of maintenance plans
- generation production plant and equipment, its location and operating parameters
- legislation, industry standards, codes of practice and regulations
- maintenance methods

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- maintenance plan development using maintenance planning philosophies and practices
- maintenance plan implementation
- manufacturers' specifications and manuals
- quality control
- risk management
- typical arrangements of power production plant
- WHS/OHS legislated requirements including:
  - emergency procedures
  - risk control measures
  - safe working practices
- workplace documentation
- workplace policies and procedures

Assessment Conditions

As a minimum, assessors must satisfy applicable regulatory requirements, which include requirements in the Standards for Registered Training Organisations current at the time of assessment.

As a minimum, assessment must satisfy applicable regulatory requirements, which include requirements in the Standards for Registered Training Organisations current at the time of assessment.

Assessment processes and techniques must be appropriate to the language, literacy and numeracy requirements of the work being performed and the needs of the candidate.

Assessment must occur in workplace operational situations. Where this is not appropriate, assessment must occur in simulated workplace operational situations that reflect workplace conditions.

Resources for assessment must include access to:

- a range of relevant exercises, case studies and/or other simulations
- relevant and appropriate materials, tools, equipment and personal protective equipment currently used in industry
- applicable documentation including workplace procedures, industry standards, equipment specifications, regulations, codes of practice and operation manuals

Links

Companion Volume implementation guides are found in VETNet - https://vetnet.gov.au/Pages/TrainingDocs.aspx?q=1715b9fa-e7bd-441c-bb8d-cf22c9c825a8

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UEPOPS426 Interpret and analyse multi-operation protection devices

Modification History

Release 1. This is the first release of this unit of competency in the UEP Generation Training Package.

Application

This unit involves the skills and knowledge required to interpret and analyse multi-operation High Voltage (H.V.) protection devices.

Power protection schemes aim to keep the power system stable by isolating only faulty plant or equipment, whilst leaving as much of the network as possible in operation. The devices that are used to protect the power system are called protection devices.

Competency in this unit requires the ability to respond to a protection operation, interpret and determine cause of protection operation, restore protection and complete documentation. Individuals will, in general, work under supervision, in a power generation facility as an operator.

Power generation plant operators are typically trained and authorised to isolate, prepare plant and issue permits to work.

No licensing, legislative or certification requirements apply to this unit at the time of publication.

Note: Workplace practice

The application of the skills and knowledge described in this unit may require a licence or training permit to practice in the workplace where work is carried out on gas and electrical installations. Additional conditions may apply under state and territory legislative and regulatory licensing requirements.

Pre-requisite Unit

UEPOPS342 Interpret and analyse single operation protection devices

Competency Field

Operations

Unit Sector

Electricity generation

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Elements and Performance Criteria

ELEMENTS	PERFORMANCE CRITERIA
Elements describe the essential outcomes.	Performance criteria describe the performance needed to demonstrate achievement of the element.
1 Respond to multi-operation protection	**1.1** Protection operation is confirmed and multi-operation protection devices are identified for use, in accordance with workplace procedures
	1.2 Apparatus affected is identified, in accordance with workplace procedures
	1.3 Targets, flags and alarms are identified and recorded, in accordance with workplace procedures
	1.4 Stakeholders are advised, in accordance with workplace procedures
2 Interpret and determine cause of multi-operation protection	**2.1** Information to external stakeholders is recorded, in accordance with workplace procedures
	2.2 Information, for internal use, on use of multi-operation protection devices is collated and assessed, in accordance with workplace procedures
	2.3 Sequence of events prior to and following recognition of fault and use of multi-operation protection devices are identified and assessed, in accordance with workplace procedures
	2.4 Multiple-operation protection devices are assessed and evaluated, in accordance with workplace procedures
	2.5 Findings from assessment of multi-operation devices are analysed, in accordance with workplace procedures, to determine most probable cause of fault
3 Restore protection	**3.1** Stakeholders are informed of analysis findings and plan of action, in accordance with workplace procedures
	3.2 Multi-operation protection device indicators are reset, in accordance with workplace procedures
	3.3 Corrective action is taken, in accordance with workplace procedures, in relation to identified fault
4 Complete documentation	**4.1** Records are maintained and all use of multi-operation

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protection devices are documented, in accordance with workplace procedures

4.2 Reports are forwarded to authorised personnel, in accordance with workplace procedures

Foundation Skills

Foundation skills essential to performance are explicit in the performance criteria of this unit of competency.

Range of Conditions

Range is restricted to essential operating conditions and any other variables essential to the work environment.

Non-essential conditions may be found in the Companion Volume Implementation Guide.

Unit Mapping Information

This unit replaces and is equivalent to UEPOPS426B Interpret and analyse multi-operation protection devices.

Links

Companion Volume implementation guides are found in VETNet - https://vetnet.gov.au/Pages/TrainingDocs.aspx?q=1715b9fa-e7bd-441c-bb8d-cf22c9c825a8

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Assessment Requirements for UEPOPS426 Interpret and analyse multi-operation protection devices

Modification History

Release 1. This is the first release of this unit of competency in the UEP Generation Training Package.

Performance Evidence

Evidence required to demonstrate competence in this unit must be relevant to and satisfy all the requirements of the elements, performance criteria and range of conditions on at least two separate occasions and includes:

- applying Work, Health and Safety (WHS)/Occupational Health and Safety (OHS) requirements including:
  - emergency procedures
  - risk control measures
  - safe working practices
- communicating with stakeholders
- completing documentation
- determining cause of multi-operation protection device operation using diagnostic techniques
- evaluating protection multi-operation protection device operation and determining response
- identifying power generation plant status
- implementing legislation, industry standards, codes of practice and regulations
- interpreting manufacturers' specifications and manuals
- recognising abnormal power generation plant, system and equipment operating conditions
- responding to multi-operation protection device operation using data analysis techniques and tools
- restoring power system through use of multi-operation protection devices
- using appropriate corrective actions

Knowledge Evidence

Evidence required to demonstrate competence in this unit must be relevant to and satisfy all the requirements of the elements, performance criteria and range of conditions and includes knowledge of:

- interpreting and determining cause of faults in power generation system
- legislation, industry standards, codes of practice and regulations
- manufacturers' specifications and manuals
- multi-operation protection devices and schemes
- multi-operation protection devices operation

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- power generation plant and equipment, its location and operating parameters
- power generation plant status
- restoring protection to power generation system
- typical arrangements of power production plant
- WHS/OHS legislated requirements including:
  - emergency procedures
  - risk control measures
  - safe working practices
- workplace documentation
- workplace policies and procedures

Assessment Conditions

As a minimum, assessors must satisfy applicable regulatory requirements, which include requirements in the Standards for Registered Training Organisations current at the time of assessment.

As a minimum, assessment must satisfy applicable regulatory requirements, which include requirements in the Standards for Registered Training Organisations current at the time of assessment.

Assessment processes and techniques must be appropriate to the language, literacy and numeracy requirements of the work being performed and the needs of the candidate.

Assessment must occur in workplace operational situations. Where this is not appropriate, assessment must occur in simulated workplace operational situations that reflect workplace conditions.

Resources for assessment must include access to:

- a range of relevant exercises, case studies and/or other simulations
- relevant and appropriate materials, tools, equipment and personal protective equipment currently used in industry
- applicable documentation including workplace procedures, industry standards, equipment specifications, regulations, codes of practice and operation manuals.

Links

Companion Volume implementation guides are found in VETNet - https://vetnet.gov.au/Pages/TrainingDocs.aspx?q=1715b9fa-e7bd-441c-bb8d-cf22c9c825a8

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UEPOPS428 Develop H.V. switching programs

Modification History

Release 1. This is the first release of this unit of competency in the UEP Generation Training Package.

Application

This unit involves the skills and knowledge required to develop High Voltage (H.V.) switching programs where multiple sources of supply must be considered and managed.

Switching can be set up to provide power to critical circuits, or to entire electrical subpanels, or to allow loads in large backup generator installations to be smoothly transferred from the utility to synchronised generators and back again.

Competency in this unit requires the ability to interpret requirements, research switching programmes, draft switching programs and validate switching programs. Individuals will, in general, work under supervision, in a power generation facility as an operator.

Power generation plant operators are typically trained and authorised to isolate, prepare plant and issue permits to work.

No licensing, legislative or certification requirements apply to this unit at the time of publication.

Note: Workplace practice

The application of the skills and knowledge described in this unit may require a licence or training permit to practice in the workplace where work is carried out on gas and electrical installations. Additional conditions may apply under state and territory legislative and regulatory licensing requirements.

Pre-requisite Unit

There are no prerequisite units.

Competency Field

Operations

Unit Sector

Electricity generation

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Elements and Performance Criteria

ELEMENTS	PERFORMANCE CRITERIA
Elements describe the essential outcomes.	Performance criteria describe the performance needed to demonstrate achievement of the element.
1 Interpret requirements	**1.1** Notification of switching program requirement is confirmed and assessed, in accordance with workplace procedures
	1.2 Area of planned outage is identified in consultation with appropriate personnel and use of power generation system diagrams, drawings and maps
	1.3 Work details are interpreted from outage request and draft switching program, in accordance with workplace procedures
2 Research switching programme	**2.1** Implications of switching program on the power generation system are identified and recognised, in accordance with workplace procedures
	2.2 Types and function of switchgear to be operated are identified, in accordance with workplace procedures and their suitability for operation under forecast system conditions during scheduled outage is assessed
	2.3 System loadings, limitations and alternate supply route capabilities are evaluated, in accordance with workplace procedures to ensure system integrity
	2.4 Consultation with appropriate personnel affected by the switching programme is undertaken, in accordance with workplace procedures
	2.5 Location of isolation points are identified, in accordance with workplace procedures, to ensure shortest route when determining sequence of switching steps
	2.6 Safe working clearances are identified and maintained, in accordance with workplace procedures, and legislative requirements
	2.7 High Voltage (H.V.), Low Voltage (L.V.) and control circuitry is examined, in accordance with workplace procedures to ensure no back-feed is possible
3 Draft switching program	**3.1** Switching program draft is documented, in accordance with workplace procedures, stating location, apparatus

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	and its' identification and the operation to be conducted
	3.2 Permit to work procedures are implemented, if required, in accordance with workplace procedures
	3.3 Switching program is planned and implemented, in accordance with workplace procedures
	3.4 Switching program is checked for omissions, in accordance with workplace procedures
	3.5 All documentation supporting the switching program is completed, in accordance with workplace procedures
4 Validate switching program	**4.1** Switching program is forwarded to appropriate personnel for verification, in accordance with workplace procedures
	4.2 Documentation is recorded, in accordance with workplace procedures

Foundation Skills

Foundation skills essential to performance are explicit in the performance criteria of this unit of competency.

Range of Conditions

Range is restricted to essential operating conditions and any other variables essential to the work environment.

Non-essential conditions may be found in the Companion Volume Implementation Guide.

Unit Mapping Information

This unit replaces and is equivalent to UEPOPS428B Develop H.V. switching programs.

Links

Companion Volume implementation guides are found in VETNet - https://vetnet.gov.au/Pages/TrainingDocs.aspx?q=1715b9fa-e7bd-441c-bb8d-cf22c9c825a8

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Assessment Requirements for UEPOPS428 Develop H.V. switching programs

Modification History

Release 1. This is the first release of this unit of competency in the UEP Generation Training Package.

Performance Evidence

Evidence required to demonstrate competence in this unit must be relevant to and satisfy all the requirements of the elements, performance criteria and range of conditions on at least two separate occasions and includes:

- applying Work, Health and Safety (WHS)/Occupational Health and Safety (OHS) requirements including:
  - risk control measures
  - safe working practices
  - site emergency procedures
- communicating with personnel
- documenting and reporting switching programmes
- drafting switching program
- identifying power generation plant status
- implementing legislation, industry standards, codes of practice and regulations
- interpreting switching program requirements
- researching switching programme using data analysis techniques and tools
- utilising manufactures' specifications and manuals
- validating switching program
- working with permit to work system

Knowledge Evidence

Evidence required to demonstrate competence in this unit must be relevant to and satisfy all the requirements of the elements, performance criteria and range of conditions and includes knowledge of:

- draft switching programme
- isolations
- legislation, industry standards, codes of practice and regulations
- manufacturers' specifications and manuals
- permit to work system
- power generation plant and equipment, its location and operating parameters

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- power generation plant status
- switch programmes
- switchgear types and characteristics
- typical arrangements of power production plant
- validation of switching programs
- WHS/OHS legislated requirements including:
  - site emergency procedures
  - risk control measures
  - safe working practices
- workplace documentation
- workplace policies and procedures

Assessment Conditions

As a minimum, assessors must satisfy applicable regulatory requirements, which include requirements in the Standards for Registered Training Organisations current at the time of assessment.

As a minimum, assessment must satisfy applicable regulatory requirements, which include requirements in the Standards for Registered Training Organisations current at the time of assessment.

Assessment processes and techniques must be appropriate to the language, literacy and numeracy requirements of the work being performed and the needs of the candidate.

Assessment must occur in workplace operational situations. Where this is not appropriate, assessment must occur in simulated workplace operational situations that reflect workplace conditions.

Resources for assessment must include access to:

- a range of relevant exercises, case studies and/or other simulations
- relevant and appropriate materials, tools, equipment and personal protective equipment currently used in industry
- applicable documentation including workplace procedures, industry standards, equipment specifications, regulations, codes of practice and operation manuals.

Links

Companion Volume implementation guides are found in VETNet - https://vetnet.gov.au/Pages/TrainingDocs.aspx?q=1715b9fa-e7bd-441c-bb8d-cf22c9c825a8

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UEPOPS430 Control permit to work operations

Modification History

Release 1. This is the first release of this unit of competency in the UEP Generation Training Package.

Application

This unit involves the skills and knowledge required to perform work in association with a permit system.

Permits to work are a formal system used to control high risk activities in power generation facilities. They specify the control measures to be used. Permits ensure that all hazards and precautions have been considered before any hazardous work begins.

Competency in this unit requires the ability to plan and prepare for permit to work procedures, perform permit duties and complete work. Individuals will, in general, work as an operator, in a power generation facility.

Power generation plant operators are typically trained and authorised to isolate, prepare plant and issue permits to work.

No licensing, legislative or certification requirements apply to this unit at the time of publication.

Note: Workplace practice

The application of the skills and knowledge described in this unit may require a licence or training permit to practice in the workplace where work is carried out on gas and electrical installations. Additional conditions may apply under state and territory legislative and regulatory licensing requirements.

Pre-requisite Unit

There are no prerequisite units.

Competency Field

Operations

Unit Sector

Electricity generation

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Elements and Performance Criteria

ELEMENTS	PERFORMANCE CRITERIA
Elements describe the essential outcomes.	Performance criteria describe the performance needed to demonstrate achievement of the element.
1 Plan and prepare for permit to work procedures	**1.1** Permit to work requirements are identified from work orders, in accordance with workplace procedures and are confirmed
	1.2 Information and documentation related to controlling permit to work procedures is obtained, in accordance with workplace policies and procedures
	1.3 Work, Health and Safety (WHS)/Occupational Health and Safety (OHS) regulations, industry standards and workplace procedures are identified and monitored
	1.4 Power generation plant is identified, in accordance with workplace procedures
	1.5 Consultation with key stakeholders to identify state of power generation plant, isolations and maintenance timetable is confirmed, in accordance with workplace procedures
2 Perform permit duties	**2.1** Permit is obtained and relevance to work is confirmed, in accordance with workplace procedures and job requirements
	2.2 Isolations and appropriate barriers or taggings are confirmed, in accordance with workplace procedures and permit requirements
	2.3 Permit requirements are clarified to personnel involved in or affected by the work, in accordance with workplace procedures
	2.4 Personnel involved in work tasks are signed on to permits prior to commencement of work, in accordance with workplace procedures
	2.5 Permit conditions are monitored and controlled throughout work sequence, in accordance with workplace procedures
3 Complete work	**3.1** Power generation plant is inspected and returned to normal operation, in accordance with workplace

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procedures

3.2 Staff signed on to permit are signed off, in accordance with workplace procedures

3.3 Work is completed and appropriate personnel are notified, in accordance with workplace procedures

Foundation Skills

Foundation skills essential to performance are explicit in the performance criteria of this unit of competency.

Range of Conditions

Range is restricted to essential operating conditions and any other variables essential to the work environment.

Non-essential conditions may be found in the Companion Volume Implementation Guide.

Unit Mapping Information

This unit replaces and is equivalent to UEPOPS430B Control permit to work operations.

Links

Companion Volume implementation guides are found in VETNet - https://vetnet.gov.au/Pages/TrainingDocs.aspx?q=1715b9fa-e7bd-441c-bb8d-cf22c9c825a8

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Assessment Requirements for UEPOPS430 Control permit to work operations

Modification History

Release 1. This is the first release of this unit of competency in the UEP Generation Training Package.

Performance Evidence

Evidence required to demonstrate competence in this unit must be relevant to and satisfy all the requirements of the elements, performance criteria and range of conditions on at least two separate occasions and includes:

- applying Work, Health and Safety (WHS)/Occupational Health and Safety (OHS) requirements including:
  - emergency procedures
  - risk control measures
  - safe working practices
- communicating with personnel and key stakeholders
- completing work
- controlling permit to work system including safety procedures
- identifying power generating plant status
- implementing legislation, industry standards, codes of practice and regulations
- interpreting manufacturers' specifications and manuals
- locating power generating plant and equipment
- performing permit to work duties and procedures
- planning and preparing to use permit to work system

Knowledge Evidence

Evidence required to demonstrate competence in this unit must be relevant to and satisfy all the requirements of the elements, performance criteria and range of conditions and includes knowledge of:

- manufacturers' specifications and manuals legislation, industry standards, codes of practice and regulations
- mechanical and electrical equipment isolation techniques
- mechanical and electrical isolation equipment types and characteristics
- permit to work system and its' implementation
- power generating plant and equipment
- typical arrangements of power production plant
- WHS/OHS legislated requirements including:

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  - emergency procedures
  - risk control measures
  - safe working practices
- workplace documentation
- workplace policies and procedures including safety procedures

Assessment Conditions

As a minimum, assessors must satisfy applicable regulatory requirements, which include requirements in the Standards for Registered Training Organisations current at the time of assessment.

As a minimum, assessment must satisfy applicable regulatory requirements, which include requirements in the Standards for Registered Training Organisations current at the time of assessment.

Assessment processes and techniques must be appropriate to the language, literacy and numeracy requirements of the work being performed and the needs of the candidate.

Assessment must occur in workplace operational situations. Where this is not appropriate, assessment must occur in simulated workplace operational situations that reflect workplace conditions.

Resources for assessment must include access to:

- a range of relevant exercises, case studies and/or other simulations
- relevant and appropriate materials, tools, equipment and personal protective equipment currently used in industry
- applicable documentation including workplace procedures, industry standards, equipment specifications, regulations, codes of practice and operation manuals.

Links

Companion Volume implementation guides are found in VETNet - https://vetnet.gov.au/Pages/TrainingDocs.aspx?q=1715b9fa-e7bd-441c-bb8d-cf22c9c825a8

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UEPOPS431 Collect and analyse hydrological and meteorological data

Modification History

Release 1. This is the first release of this unit of competency in the UEP Generation Training Package.

Application

This unit involves the skills and knowledge required to predict and determine inflows in catchment areas within a hydro powered electricity generation system.

Inflow forecasting for hydro powered electricity generation systems depends on several elements such as weather, snow cover, ground conditions and the run off process in catchment areas. All these elements help give insight into future water availability.

Competency in this unit requires the ability to plan for work, plan and prepare to conduct data collection, undertake data collection, verify and report data collection and complete documentation. Individuals will, in general, work under supervision, in a power generation facility as an operator.

No licensing, legislative or certification requirements apply to this unit at the time of publication.

Note: Workplace practice

The application of the skills and knowledge described in this unit may require a licence or training permit to practice in the workplace where work is carried out on gas and electrical installations. Additional conditions may apply under state and territory legislative and regulatory licensing requirements.

Pre-requisite Unit

UEPOPS209 Perform process plant inspection

Competency Field

Operations

Unit Sector

Electricity generation

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Elements and Performance Criteria

ELEMENTS	PERFORMANCE CRITERIA
Elements describe the essential outcomes.	Performance criteria describe the performance needed to demonstrate achievement of the element.
1 Plan for work related issues	**1.1** Safety issues are identified, in accordance with workplace procedures, industry standards, legislative requirements and Work, Health and Safety (WHS)/Occupational Health and Safety (OHS) regulations
	1.2 Work, hydrological and meteorological equipment and resource requirements are identified from information and documentation, in accordance with workplace procedures
	1.3 Preoperational check on hydrological and meteorological equipment is carried out, in accordance with workplace procedures
2 Plan and prepare to conduct data collection	**2.1** Appropriate hydrological and meteorological equipment is selected, in accordance with workplace procedures, to conduct data collection
	2.2 Hydrological and meteorological equipment is recalibrated, in accordance with workplace procedures and manufacturers' specifications preparation for survey
	2.3 Potential hydrological and meteorological hazards are assessed and risk control measures are implemented, in accordance with workplace procedures
	2.4 Meteorological charts and data are assessed for use, in accordance with workplace procedures
3 Undertake data collection	**3.1** Measurement site in catchment area is established, in accordance with workplace procedures
	3.2 Hydrological and meteorological instrumentation is set out in the catchment area, in accordance with workplace procedures and manufacturers' specifications
	3.3 Measurements are taken, in accordance with workplace procedures
	3.4 Measurements are record, in accordance with workplace procedures

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	3.5	Tools and equipment used, are cleaned and stored, in accordance with workplace procedures
4 Verify and report data	**4.1**	Measurements are analysed to verify accuracy of findings, and data is entered into data system, in accordance with workplace procedures
	4.2	Work order requirements are completed, in accordance with workplace procedures

Foundation Skills

Foundation skills essential to performance are explicit in the performance criteria of this unit of competency.

Range of Conditions

Range is restricted to essential operating conditions and any other variables essential to the work environment.

Non-essential conditions may be found in the Companion Volume Implementation Guide.

Unit Mapping Information

This unit replaces and is equivalent to UEPOPS431B Collect and analyse hydrological and meteorological data.

Links

Companion Volume implementation guides are found in VETNet - https://vetnet.gov.au/Pages/TrainingDocs.aspx?q=1715b9fa-e7bd-441c-bb8d-cf22c9c825a8

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Assessment Requirements for UEPOPS431 Collect and analyse hydrological and meteorological data

Modification History

Release 1. This is the first release of this unit of competency in the UEP Generation Training Package.

Performance Evidence

Evidence required to demonstrate competence in this unit must be relevant to and satisfy all the requirements of the elements, performance criteria and range of conditions on at least two separate occasions and includes:

- analysing meteorological and hydrographical data using analysis techniques and tools
- applying Work, Health and Safety (WHS)/Occupational Health and Safety (OHS) requirements including:
  - emergency procedures
  - risk control measures
  - safe working practices
- completing documentation
- coordinating the operation of meteorological and hydrographical instrumentation and equipment to undertake
  - conducting and calculating depth measurements
  - determining inflows based on snow melt
  - measuring snow depth and stream flows
- displaying safety procedures in remote locations including survival techniques
- implementing legislation, industry standards, codes of practice and regulations
- planning and preparing to conduct data collection
- recognising abnormal meteorological and hydrographical conditions interpreting manufacturers' specifications and manuals
- undertaking data collection
- verifying and reporting data collection

Knowledge Evidence

Evidence required to demonstrate competence in this unit must be relevant to and satisfy all the requirements of the elements, performance criteria and range of conditions and includes knowledge of:

- calibration of meteorological and hydrographical instrumentation
- inflow forecasting

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- interpretation of hydrological and meteorological data using analysing tools and techniques
- interpreting meteorological charts
- legislation, industry standards, codes of practice and regulations
- manufacturers' specifications and manuals
- meteorological and hydrographical equipment, its location and operating parameters
- personal safety and working alone in remote locations
- snow depth gauging
- stream gauging
- survival techniques including hypothermia and snake avoidance
- water quality monitoring
- WHS/OHS legislated requirements including:
  - risk control measures
  - emergency procedures
  - safe working practices
- workplace documentation
- workplace policies and procedures

Assessment Conditions

As a minimum, assessors must satisfy applicable regulatory requirements, which include requirements in the Standards for Registered Training Organisations current at the time of assessment.

As a minimum, assessment must satisfy applicable regulatory requirements, which include requirements in the Standards for Registered Training Organisations current at the time of assessment.

Assessment processes and techniques must be appropriate to the language, literacy and numeracy requirements of the work being performed and the needs of the candidate.

Assessment must occur in workplace operational situations. Where this is not appropriate, assessment must occur in simulated workplace operational situations that reflect workplace conditions.

Resources for assessment must include access to:

- a range of relevant exercises, case studies and/or other simulations
- relevant and appropriate materials, tools, equipment and personal protective equipment currently used in industry
- applicable documentation including workplace procedures, industry standards, equipment specifications, regulations, codes of practice and operation manuals.

Links

Companion Volume implementation guides are found in VETNet - https://vetnet.gov.au/Pages/TrainingDocs.aspx?q=1715b9fa-e7bd-441c-bb8d-cf22c9c825a8

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UEPOPS432 Start up a heat recovery steam generator unit

Modification History

Release 1. This is the first release of this unit of competency in the UEP Generation Training Package.

Application

This unit involves the skills and knowledge required to start up a Heat Recovery Steam Generator (HRSG) for service.

HRSGs are recovery heat exchangers that retrieve the heat from hot gas streams which are then supplied to steam turbines to generate additional electric power. Placing an HRSG in-service will require the entry of a heating medium and the control of water within the steam and/or water drum. It includes monitoring the flow and quality of feedwater, steam pressure and temperature increases and metal temperatures within HSRG design limits so that the HRSG is supplying a constant flow of steam at the required temperature and pressure.

Competency in this unit requires the ability to plan and prepare start up, operate HRSG plant during start up, test and analyse HRSG system faults and complete documentation. Individuals will, in general, work under supervision, in a power generation facility as an operator.

Power generation plant operators are typically trained and authorised to isolate, prepare plant and issue permits to work.

No licensing, legislative or certification requirements apply to this unit at the time of publication.

Note: Workplace practice

The application of the skills and knowledge described in this unit may require a licence or training permit to practice in the workplace where work is carried out on gas and electrical installations. Additional conditions may apply under state and territory legislative and regulatory licensing requirements.

Pre-requisite Unit

UEPOPS333 Operate and monitor HRSG hot gas control system

Competency Field

Operations

Unit Sector

Electricity generation

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Elements and Performance Criteria

ELEMENTS	PERFORMANCE CRITERIA
Elements describe the essential outcomes.	Performance criteria describe the performance needed to demonstrate achievement of the element.
1 Plan and prepare HRSG start up work	**1.1** Safety issues are identified in accordance with Work, Health and Safety (WHS)/Occupational Health and Safety (OHS) regulations and workplace procedures
	1.2 Work requirements are identified from relevant personnel and documentation, in accordance with workplace procedures
	1.3 Preoperational checks are carried out on plant, in accordance with manufacturers' recommendations and workplace procedures and site requirements
2 Conduct HRSG start up	**2.1** Preoperation conditions of the Heat Recovery Steam Generator (HRSG) and gas turbine are established, in accordance with workplace procedures
	2.2 Minimum operation of gas turbine is established and supported, in accordance with workplace procedures and manufacturers' specifications
	2.3 Monitoring of HRSG drum level, feedwater flow, steam and metal temperature rates of rise, steam pressure rate of rise and control of steam flow and drainage is carried out, in accordance with manufacturers' specifications and workplace procedures
	2.4 Exhaust temperature, flow to HRSG and gas turbine power output are adjusted, in accordance workplace procedures, to achieve required steam conditions and demand
	2.5 HRSG plant is operated within limits of its' design, in accordance with workplace procedures.
	2.6 HRSG plant is monitored, in accordance with workplace procedures, to detect deviations from required operating conditions
	2.7 Corrective action is taken to rectify HRSG abnormalities, in accordance with manufacturers' recommendations and workplace procedures

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3 Test HRSG plant operation	**3.1**	Tests are performed, in accordance with workplace procedures
	3.2	HRSG plant is observed, in accordance with workplace procedures, for correct operational response
	3.3	Corrective action is taken, in accordance with workplace procedures, when response does not meet documentation, plant integrity or personnel safety requirements
	3.4	HRSG plant is returned to required operational status upon completion of testing, in accordance with workplace procedures
4 Analyse HRSG faults	**4.1**	Causes of abnormal HRSG plant operating conditions are identified, in accordance with workplace procedures, by analysing technical and operational information
	4.2	Corrective action is taken, in accordance with workplace procedures
	4.3	HRSG plant integrity and personnel safety is maintained, in accordance with workplace procedures, and through consultation with appropriate personnel and technical and operational documentation
	4.4	Appropriate personnel are notified, in accordance with workplace procedures, when defects are detected
5 Complete documentation	**5.1**	HRSG plant problems, movements and status are reported, in accordance with workplace procedures
	5.2	Documentation is updated, in accordance with workplace procedures

Foundation Skills

Foundation skills essential to performance are explicit in the performance criteria of this unit of competency.

Range of Conditions

Range is restricted to essential operating conditions and any other variables essential to the work environment.

Non-essential conditions may be found in the Companion Volume Implementation Guide.

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Unit Mapping Information

This unit replaces and is equivalent to UEPOPS432B Start up a heat recovery steam generator unit.

Links

Companion Volume implementation guides are found in VETNet - https://vetnet.gov.au/Pages/TrainingDocs.aspx?q=1715b9fa-e7bd-441c-bb8d-cf22c9c825a8

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Assessment Requirements for UEPOPS432 Start up a heat recovery steam generator unit

Modification History

Release 1. This is the first release of this unit of competency in the UEP Generation Training Package.

Performance Evidence

Evidence required to demonstrate competence in this unit must be relevant to and satisfy all the requirements of the elements, performance criteria and range of conditions on at least two separate occasions and includes:

- applying Work, Health and Safety (WHS)/Occupational Health and Safety (OHS) legislated requirements including:
  - emergency procedures
  - risk control measures
  - safe working practices
- communicating with personnel
- identifying HRSG plant status
- monitoring and operating HRSG plant and equipment
- organise resources
- planning and preparing HRSG plant and equipment for start and run up operations
- recognising and responding to abnormal HRSG plant operating conditions
- starting, running up and operating HRSG and associated plant and equipment
- testing HRSG plant operation using diagnostic and data analysis techniques and tools to determine faults
- using recording procedures to complete documentation
- utilising temperature and pressure raising techniques
- working with permit to work system

Knowledge Evidence

Evidence required to demonstrate competence in this unit must be relevant to and satisfy all the requirements of the elements, performance criteria and range of conditions and includes knowledge of:

- control of heat transfer and rate of temperature rise during HRSG start up
- HRSG plant and equipment, its location and operating parameters
- manufacturers specifications and manuals
- operational testing of HRSG plant
- permit to work system

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- techniques HRSG plant and equipment operation
- temperature and pressure raising requirements
- typical arrangements of power production plant
- WHS/OHS legislation requirements including:
  - emergency procedures
  - risk control measures
  - safe working practices and principles
- workplace policies and procedures
- workplace documentation

Assessment Conditions

As a minimum, assessors must satisfy applicable regulatory requirements, which include requirements in the Standards for Registered Training Organisations current at the time of assessment.

As a minimum, assessment must satisfy applicable regulatory requirements, which include requirements in the Standards for Registered Training Organisations current at the time of assessment.

Assessment processes and techniques must be appropriate to the language, literacy and numeracy requirements of the work being performed and the needs of the candidate.

Assessment must occur in workplace operational situations. Where this is not appropriate, assessment must occur in simulated workplace operational situations that reflect workplace conditions.

Resources for assessment must include access to:

- a range of relevant exercises, case studies and/or other simulations
- relevant and appropriate materials, tools, equipment and personal protective equipment currently used in industry
- applicable documentation including workplace procedures, industry standards, equipment specifications, regulations, codes of practice and operation manuals.

Links

Companion Volume implementation guides are found in VETNet - https://vetnet.gov.au/Pages/TrainingDocs.aspx?q=1715b9fa-e7bd-441c-bb8d-cf22c9c825a8

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UEPOPS433 Operate and monitor a heat recovery steam generator unit

Modification History

Release 1. This is the first release of this unit of competency in the UEP Generation Training Package.

Application

This unit involves the skills and knowledge required to operate an in-service Heat Recover Steam Generator (HRSG). Operation of the HRSG, with or without supplementary firing, will be required through the full range of output, up to and including the maximum continuous rating.

A HRSG is a heat exchanger that retrieves heat from hot gas streams which is then supplied to steam turbines to generate additional electrical power.

Competency in this unit requires the ability to plan work, carry out operation of HRSG system, test HRSG operation, analyse HRSG system faults, inspect and monitor HRSG system and complete all documentation. Individuals will, in general, work under supervision, in a power generation facility as an operator.

Power generation plant operators are typically trained and authorised to isolate, prepare plant and issue permits to work.

No licensing, legislative or certification requirements apply to this unit at the time of publication.

Note: Workplace practice

The application of the skills and knowledge described in this unit may require a licence or training permit to practice in the workplace where work is carried out on gas and electrical installations. Additional conditions may apply under state and territory legislative and regulatory licensing requirements.

Pre-requisite Unit

UEPOPS333 Operate and monitor HRSG hot gas control system

UEPOPS407 Start and run up a gas turbine

UEPOPS433 Start up a heat recovery steam generator unit

Competency Field

Operations

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Unit Sector

Electricity generation

Elements and Performance Criteria

ELEMENTS	PERFORMANCE CRITERIA
Elements describe the essential outcomes.	Performance criteria describe the performance needed to demonstrate achievement of the element.
1 Plan and prepare work	**1.1** Safety issues related to operating and monitoring Heat Recovery Steam Generator (HRSG) plant are identified, in accordance with workplace procedures and Work, Health and Safety (WHS)/Occupational Health and Safety (OHS) regulations and legislative requirements
	1.2 Work requirements are identified, in accordance with workplace procedures, from relevant personnel and documentation
	1.3 Operational checks are carried out on HRSG plant, in accordance with workplace procedures, manufacturers' recommendations and site requirements
2 Operate HRSG plant	**2.1** Gas turbine exhaust flow and power output are adjusted, in accordance with workplace procedures and operating requirements, to achieve steam flow conditions
	2.2 Supplementary HRSG firing system, is placed into and out of service, as required, in accordance with workplace procedures, to maintain design steam flow and conditions
	2.3 Monitoring and control of HRSG drum level, feedwater flow, steam temperature, pressure and flow are carried out, in accordance with workplace procedures, manufacturers' recommendations and site requirements
	2.4 HRSG plant is operated within limits of its' design, and site requirements, in accordance with workplace procedures
	2.5 Corrective action is taken to rectify HRSG abnormalities, in accordance with workplace procedures and manufacturers' recommendations procedures
3 Monitor HRSG plant	**3.1** HRSG plant to be monitored is identified in accordance

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		with workplace procedures
	3.2	HSRG plant is monitored, in accordance with workplace procedures, for normal operation and/or to detect deviations from required operating conditions
	3.3	HSRG plant integrity and personnel safety is maintained, in accordance with workplace procedures, and in consultation with appropriate personnel and technical and operational documentation
	3.4	Appropriate personnel are notified, in accordance with workplace procedures, when defects are detected
4 Analyse HSRG faults	**4.1**	Causes of abnormal HRSG plant operating conditions are identified, in accordance with workplace procedures, and by analysing relevant technical and operational information
	4.2	Corrective action is taken, in accordance with workplace procedures
5 Test HSRG plant operation	**5.1**	Operational tests are performed, in accordance with workplace procedures
	5.2	HRSG plant is observed for correct operational response, in accordance with workplace procedures
	5.3	HRSG plant is returned to required operational status upon completion of testing, in accordance with workplace procedures
	5.4	Corrective action is taken, in accordance with workplace procedures, when response does not meet with documentation, HRSG plant integrity or personnel safety requirements
6 Complete documentation	**6.1**	HSRG plant problems, movements and status are reported, in accordance with workplace procedures
	6.2	Documentation is updated, in accordance with workplace procedures

Foundation Skills

Foundation skills essential to performance are explicit in the performance criteria of this unit of competency.

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Range of Conditions

Range is restricted to essential operating conditions and any other variables essential to the work environment.

Non-essential conditions may be found in the Companion Volume Implementation Guide.

Unit Mapping Information

This unit replaces and is equivalent to UEPOPS433B Operate and monitor a heat recovery steam generator unit.

Links

Companion Volume implementation guides are found in VETNet - https://vetnet.gov.au/Pages/TrainingDocs.aspx?q=1715b9fa-e7bd-441c-bb8d-cf22c9c825a8

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Assessment Requirements for UEPOPS433 Operate and monitor a heat recovery steam generator unit

Modification History

Release 1. This is the first release of this unit of competency in the UEP Generation Training Package.

Performance Evidence

Evidence required to demonstrate competence in this unit must be relevant to and satisfy all the requirements of the elements, performance criteria and range of conditions on at least two separate occasions and includes:

- analysing system faults using data analysis techniques and tools
- applying Work, Health and Safety (WHS)/Occupational Health and Safety (OHS) requirements including:
  - emergency procedures
  - risk control measures
  - safe working practices
- communicating with personnel
- completing documentation using recording procedures
- identifying HRSG plant status
- implementing legislation, industry standards, codes of practice and regulations
- interpreting manufacturers' specifications and manuals
- operating and monitoring Heat Recovery Steam Generator (HRSG) plant and equipment
- organising resources
- preparing HRSG plant and equipment for operation
- recognising and responding to abnormal HRSG plant operating conditions
- testing plant operation using diagnostic and test techniques
- working with permit to work system

Knowledge Evidence

Evidence required to demonstrate competence in this unit must be relevant to and satisfy all the requirements of the elements, performance criteria and range of conditions and includes knowledge of:

- HRSG plant and equipment, its location and operating parameters
- legislation, industry standards, codes of practice and regulations
- manufacturers' specifications and manuals
- operation of HRSG plant and equipment

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- operational testing of HRSG plant including HRSG efficiency
- permit to work system
- typical arrangements of power production plant
- WHS/OHS legislated requirements including:
  - emergency procedures
  - risk control measures
  - safe working practices
- workplace documentation
- workplace policies and procedures

Assessment Conditions

As a minimum, assessors must satisfy applicable regulatory requirements, which include requirements in the Standards for Registered Training Organisations current at the time of assessment.

As a minimum, assessment must satisfy applicable regulatory requirements, which include requirements in the Standards for Registered Training Organisations current at the time of assessment.

Assessment processes and techniques must be appropriate to the language, literacy and numeracy requirements of the work being performed and the needs of the candidate.

Assessment must occur in workplace operational situations. Where this is not appropriate, assessment must occur in simulated workplace operational situations that reflect workplace conditions.

Resources for assessment must include access to:

- a range of relevant exercises, case studies and/or other simulations
- relevant and appropriate materials, tools, equipment and personal protective equipment currently used in industry
- applicable documentation including workplace procedures, industry standards, equipment specifications, regulations, codes of practice and operation manuals.

Links

Companion Volume implementation guides are found in VETNet - https://vetnet.gov.au/Pages/TrainingDocs.aspx?q=1715b9fa-e7bd-441c-bb8d-cf22c9c825a8

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UEPOPS434 Shut down a heat recovery steam generator unit

Modification History

Release 1. This is the first release of this unit of competency in the UEP Generation Training Package.

Application

This unit involves the skills and knowledge required to shut down an in-service Heat Recovery Steam Generator (HRSG) unit.

HRSGs are heat exchangers that retrieve heat from hot gas streams which is then supplied to steam turbines to generate additional electric power. Shutting down an HRSG unit, with or without supplementary firing, to a boxed up condition will require the hot and cold gas outlet dampers to be closed and the steam water drum to be pressurised at a normal working level prior to a hot or warm restart, or to be in a depressurised state in preparation for a short or long outage.

Competency in this unit requires the ability to plan and prepare shut down, operate plant during shut down, test and analyse steam turbine system faults and completing documentation. Individuals will, in general, work under supervision, in a power generation facility as an operator

Power generation plant operators are typically trained and authorised to isolate, prepare plant and issue permits to work.

No licensing, legislative or certification requirements apply to this unit at the time of publication.

Note: Workplace practice

The application of the skills and knowledge described in this unit may require a licence or training permit to practice in the workplace where work is carried out on gas and electrical installations. Additional conditions may apply under state and territory legislative and regulatory licensing requirements.

Pre-requisite Unit

UEPOPS333 Operate and monitor HRSG hot gas control system

UEPOPS408 Shut down a gas turbine

Competency Field

Operations

Unit Sector

Electricity generation

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Elements and Performance Criteria

ELEMENTS	PERFORMANCE CRITERIA
Elements describe the essential outcomes.	Performance criteria describe the performance needed to demonstrate achievement of the element.
1 Plan and prepare work	**1.1** Safety issues are identified, in accordance with Work, Health and Safety (WHS)/Occupational Health and Safety (OHS) regulations and workplace procedures
	1.2 Work requirements are identified from relevant personnel and documentation, in accordance with workplace procedures
	1.3 Preoperational checks are carried out on HRSG plant in accordance with manufacturers' recommendations and workplace procedures and site requirements
2 Operate HRSG plant during shut down	**2.1** Supplementary firing system is placed in and out of service, in accordance with workplace procedures and manufacturers' recommendations
	2.2 Gas turbine exhaust gas flow and power output are adjusted to achieve required steam temperature, pressure and flow conditions, in accordance with workplace procedures
	2.3 Feedwater flows are adjusted to achieve required steam conditions and demand in accordance with workplace procedures
	2.4 HRSG drains and vents are operated, in accordance with workplace procedures and manufacturers' recommendations to depressurise and drain steam and/or water space and heat exchange elements
	2.5 HRSG plant is maintained in required out of service condition, in accordance with workplace procedures and manufacturers' recommendations
	2.6 Boiler water quality is maintained within required parameters to prevent corrosion of drums, headers and heat exchange elements, in accordance with workplace procedures
	2.7 HRSG plant is operated within limits of its' design, in accordance with workplace procedures

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	2.8	HRSG plant is monitored, in accordance with workplace procedures to detect deviations from required operating conditions
	2.9	Corrective action is taken to rectify HRSG plant abnormalities, in accordance with manufacturers' recommendations and workplace procedures
3 Test HRSG plant operation during shut down	**3.1**	Tests are performed, in accordance with workplace procedures
	3.2	Power generation system and HRSG plant are observed for correct operational response, in accordance with workplace procedures
	3.3	Corrective action is taken, in accordance with workplace procedures, when response does not meet documentation, HRSG plant integrity or personnel safety requirements
	3.4	HRSG plant is returned to required operational status upon completion of testing, in accordance with workplace procedures
4 Analyse system faults	**4.1**	Causes of abnormal HRSG plant operating conditions are identified, in accordance with workplace procedures, by analysing technical and operational information
	4.2	Corrective action is taken, in accordance with workplace procedures
	4.3	HRSG plant integrity and personnel safety is maintained, in accordance with workplace procedures, through consultation with appropriate personnel and technical and operational documentation
	4.4	Appropriate personnel are notified, in accordance with workplace procedures, when defects are detected
5 Complete documentation	**5.1**	HRSG plant problems, movements and status are reported, in accordance with workplace procedures
	5.2	Documentation is updated, in accordance with workplace procedures

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Foundation Skills

Foundation skills essential to performance are explicit in the performance criteria of this unit of competency.

Range of Conditions

Range is restricted to essential operating conditions and any other variables essential to the work environment.

Non-essential conditions may be found in the Companion Volume Implementation Guide.

Unit Mapping Information

This unit replaces and is equivalent to UEPOPS434B Shut down a heat recovery steam generator unit.

Links

Companion Volume implementation guides are found in VETNet - https://vetnet.gov.au/Pages/TrainingDocs.aspx?q=1715b9fa-e7bd-441c-bb8d-cf22c9c825a8

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Assessment Requirements for UEPOPS434 Shut down a heat recovery steam generator unit

Modification History

Release 1. This is the first release of this unit of competency in the UEP Generation Training Package.

Performance Evidence

Evidence required to demonstrate competence in this unit must be relevant to and satisfy all the requirements of the elements, performance criteria and range of conditions on at least two separate occasions and includes:

- applying Work, Health and Safety (WHS)/Occupational Health and Safety (OHS) legislation including:
  - emergency procedures
  - risk control measures
  - safe working practices
- communicating with personnel
- completing documentation using recording procedures
- identifying HRSG plant status
- organising resources
- planning for HRSG plant shut down
- preparing and operating Heat Recovery Steam Generator (HRSG) plant and equipment
- responding to abnormal HRSG plant operating conditions
- shutting down HRSG plant operations
- testing HRSG plant operation using diagnostic and data analysis techniques and tools to determine faults
- using temperature and pressure reducing techniques and principles
- working with permit to work system

Knowledge Evidence

Evidence required to demonstrate competence in this unit must be relevant to and satisfy all the requirements of the elements, performance criteria and range of conditions and includes knowledge of:

- control of steam temperature and pressure throughout full range of heat recovery steam generation operation up to and including maximum continuous rating
- depressurisation and cooling
- heat recovery steam generator gas path and water and steam circuits
- HRSG system components and the interaction of these components with other power

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generation plant and equipment
- legislation, industry standards, codes of practice and regulations
- manufacturers' specifications and manuals
- operation techniques for HRSG plant and equipment
- permit to work system
- typical arrangements of power production plant
- Work, Health and Safety (WHS)/Occupational Health and Safety (OHS) including:
  - emergency procedures
  - risk control measures
  - safe working practices
- workplace documentation
- workplace policies and procedures

Assessment Conditions

As a minimum, assessors must satisfy applicable regulatory requirements, which include requirements in the Standards for Registered Training Organisations current at the time of assessment.

As a minimum, assessment must satisfy applicable regulatory requirements, which include requirements in the Standards for Registered Training Organisations current at the time of assessment.

Assessment processes and techniques must be appropriate to the language, literacy and numeracy requirements of the work being performed and the needs of the candidate.

Assessment must occur in workplace operational situations. Where this is not appropriate, assessment must occur in simulated workplace operational situations that reflect workplace conditions.

Resources for assessment must include access to:

- a range of relevant exercises, case studies and/or other simulations
- relevant and appropriate materials, tools, equipment and personal protective equipment currently used in industry
- applicable documentation including workplace procedures, industry standards, equipment specifications, regulations, codes of practice and operation manuals.

Links

Companion Volume implementation guides are found in VETNet - https://vetnet.gov.au/Pages/TrainingDocs.aspx?q=1715b9fa-e7bd-441c-bb8d-cf22c9c825a8

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UEPOPS435 Operate and monitor flue gas (NOx) mitigation systems

Modification History

Release 1. This is the first release of this unit of competency in the UEP Generation Training Package.

Application

This unit involves the skills and knowledge required for the operation, inspection and monitoring of flue gas (NOx) mitigation systems. Flue gas (NOx) mitigation systems are typically used by coal, gas, oil and biomass fired oil and gas fired gas turbines and combined cycle power generation facilities.

Nitrogen Oxides (NOx) are poisonous gases derived from nitrogen and oxygen combustion under high pressure and temperatures. NOx is composed of nitric oxide (NO), and a smaller percentage of more poisonous nitrogen dioxide (NO2).

Competency in this unit requires the ability to plan work, carry out operation of flue gas (NOx) mitigation system, test flue gas (NOx) mitigation operation, analyse flue gas (NOx) mitigation system faults, inspect and monitor flue gas (NOx) mitigation system and complete all documentation. Individuals will, in general, work under supervision, in a power generation facility as an operator.

Power generation plant operators are typically trained and authorised to isolate, prepare plant and issue permits to work.

No licensing, legislative or certification requirements apply to this unit at the time of publication.

Note: Workplace practice

The application of the skills and knowledge described in this unit may require a licence or training permit to practice in the workplace where work is carried out on gas and electrical installations. Additional conditions may apply under state and territory legislative and regulatory licensing requirements.

Pre-requisite Unit

There are no prerequisite units.

Competency Field

Operations

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Unit Sector

Electricity generation

Elements and Performance Criteria

ELEMENTS	PERFORMANCE CRITERIA
Elements describe the essential outcomes.	Performance criteria describe the performance needed to demonstrate achievement of the element.
1 Plan and prepare work	**1.1** Safety issues for flue gas (NOx) mitigation are identified, in accordance with workplace procedures and Work, Health and Safety (WHS)/Occupational Health and Safety (OHS) regulations and legislative requirements
	1.2 Work requirements including the use of Personal Protective Equipment (PPE), permits and risk control measures are identified, in accordance with workplace procedures, from relevant personnel and documentation
	1.3 Inspection, preoperational checks and preparations for flue gas (NOx) mitigation service are carried out, in accordance with workplace procedures and manufacturers' recommendations procedures
	1.4 Flue gas (NOx) mitigation plant operational prerequisites are established, in accordance with workplace procedures and manufacturers' recommendations
	1.5 Sequence for recommissioning of flue gas (NOx) mitigation plant is determined to suit existing circumstances, in accordance with workplace procedures and site requirements
2 Operate flue gas (NOx) mitigation plant	**2.1** Flue gas (NOx) mitigation plant is operated, in accordance with workplace procedures and manufacturers' operating recommendations
	2.2 Flue gas (NOx) mitigation plant is monitored and observed, in accordance with workplace procedures, to detect deviations from normal operating conditions
	2.3 Corrective actions are taken to rectify flue gas (NOx) mitigation abnormalities, in accordance with workplace procedures, industry standards and site requirements

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3	**Test flue gas (NOx) mitigation plant operation**	**3.1** Operational tests are performed, in accordance with workplace procedures
		3.2 Flue gas (NOx) mitigation plant is observed for correct operational response, in accordance with workplace procedures
		3.3 Corrective action is taken, in accordance with workplace procedures, when response does not meet with documentation, flue gas (NOx) mitigation plant integrity or personnel safety requirements
		3.4 Flue gas (NOx) mitigation plant is returned to required operational status upon completion of test, in accordance with workplace procedures
4	**Analyse flue gas (NOx) mitigation plant faults**	**4.1** Causes of abnormal flue gas (NOx) mitigation plant operating conditions are identified, in accordance with workplace procedures, and by analysing technical and operational information
		4.2 Corrective action is taken, in accordance with workplace procedures
		4.3 Flue gas (NOx) mitigation plant integrity and personnel safety is maintained, in accordance with workplace procedures, and in consultation with appropriate personnel and technical and operational documentation
5	**Monitor and inspect flue gas (NOx) mitigation plant**	**5.1** Flue gas (NOx) mitigation plant to be monitored and inspected is physically identified, in accordance with workplace procedures
		5.2 Flue gas (NOx) mitigation plant is monitored and inspected, in accordance with workplace procedures, for normal operation or to detect deviations
		5.3 Corrective action is taken, in accordance with workplace procedures
		5.4 Appropriate personnel are notified, in accordance with workplace procedures, when defects are detected
6	**Complete documentation**	**6.1** Flue gas (NOx) mitigation plant problems, movements and status are reported, in accordance with workplace procedures
		6.2 Documentation is updated, in accordance with workplace procedures

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Foundation Skills

Foundation skills essential to performance are explicit in the performance criteria of this unit of competency.

Range of Conditions

Range is restricted to essential operating conditions and any other variables essential to the work environment.

Non-essential conditions may be found in the Companion Volume Implementation Guide.

Unit Mapping Information

This unit replaces and is equivalent to UEPOPS435B Operate and monitor flue gas (NOx) mitigation systems.

Links

Companion Volume implementation guides are found in VETNet - https://vetnet.gov.au/Pages/TrainingDocs.aspx?q=1715b9fa-e7bd-441c-bb8d-cf22c9c825a8

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Assessment Requirements for UEPOPS435 Operate and monitor flue gas (NOx) mitigation systems

Modification History

Release 1. This is the first release of this unit of competency in the UEP Generation Training Package.

Performance Evidence

Evidence required to demonstrate competence in this unit must be relevant to and satisfy all the requirements of the elements, performance criteria and range of conditions on at least two separate occasions and includes:

- analysing flue gas (NOx) mitigation plant faults using data analysis techniques and tools
- applying Work, Health and Safety (WHS)/Occupational Health and Safety (OHS) requirements including:
  - emergency procedures
  - risk control measures
  - safe working practices
- communicating with personnel
- completing documentation using recording procedures
- identifying flue gas (NOx) mitigation plant status
- implementing legislation, industry standards, codes of practice and regulations
- interpreting manufacturers' specifications and manuals
- monitoring and inspecting flue gas (NOx) mitigation plant
- operating flue gas (NOx) emission control plant and equipment
- organising resources
- preparing flue gas (NOx) mitigation plant and/or equipment
- recognising and responding to abnormal flue gas (NOx) mitigation plant operating conditions
- testing flue gas (NOx) mitigation plant operation using diagnostic and test techniques
- working with permit to work system

Knowledge Evidence

Evidence required to demonstrate competence in this unit must be relevant to and satisfy all the requirements of the elements, performance criteria and range of conditions and includes knowledge of:

- legislation, industry standards, codes of practice and regulations
- manufacturers' specifications and manuals
- NOx mitigation system plant and equipment, its location and operating parameters including:

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  - NOx generation during combustion process within fossil fuelled boilers and gas turbines
  - NOx emission control plant and equipment components and the way they interact with plant and/or equipment
- performance tests on NOx mitigation system plant
- permit to work system
- typical arrangements of power production plant
- WHS/OHS legislated requirements including:
  - emergency procedures
  - risk control measures
  - safe working practices
- workplace documentation
- workplace policies and procedures

Assessment Conditions

As a minimum, assessors must satisfy applicable regulatory requirements, which include requirements in the Standards for Registered Training Organisations current at the time of assessment.

As a minimum, assessment must satisfy applicable regulatory requirements, which include requirements in the Standards for Registered Training Organisations current at the time of assessment.

Assessment processes and techniques must be appropriate to the language, literacy and numeracy requirements of the work being performed and the needs of the candidate.

Assessment must occur in workplace operational situations. Where this is not appropriate, assessment must occur in simulated workplace operational situations that reflect workplace conditions.

Resources for assessment must include access to:

- a range of relevant exercises, case studies and/or other simulations
- relevant and appropriate materials, tools, equipment and personal protective equipment currently used in industry
- applicable documentation including workplace procedures, industry standards, equipment specifications, regulations, codes of practice and operation manuals.

Links

Companion Volume implementation guides are found in VETNet - https://vetnet.gov.au/Pages/TrainingDocs.aspx?q=1715b9fa-e7bd-441c-bb8d-cf22c9c825a8

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UEPOPS437 Manage system restart

Modification History

Release 1. This is the first release of this unit of competency in the UEP Generation Training Package.

Application

This unit involves the skills and knowledge required to manage a power generation system restart after the islanding or shut down of the system and/or network.

A restart is the process of restoring an electric power generating facility to operation without relying on an external transmission network. Power generation system restarts allow parts of the power system to be re-energised through black start equipped generation capacity following a black out.

Competency in this unit requires the ability to identify cause for power generating system restart, restore power generating system and document work. Individuals will, in general, work as an operator with responsibility for managing system restarts in a power generation facility.

Power generation plant operators are typically trained and authorised to isolate, prepare plant and issue permits to work.

No licensing, legislative or certification requirements apply to this unit at the time of publication.

Note: Workplace practice

The application of the skills and knowledge described in this unit may require a licence or training permit to practice in the workplace where work is carried out on gas and electrical installations. Additional conditions may apply under state and territory legislative and regulatory licensing requirements.

Pre-requisite Unit

There are no prerequisite units.

Competency Field

Operations

Unit Sector

Electricity generation

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Elements and Performance Criteria

ELEMENTS	PERFORMANCE CRITERIA
Elements describe the essential outcomes.	Performance criteria describe the performance needed to demonstrate achievement of the element.
1 Identify cause for system/network restart	**1.1** Probable implications of power generation system restart are identified and assessed, in accordance with Work, Health and Safety (WHS)/Occupational Health and Safety (OHS) regulations and workplace procedures
	1.2 Secondary threats to power generation system restart are identified and monitored, in accordance with workplace procedures
	1.3 Power generation system configuration or generation capability is evaluated, in accordance with workplace procedures
	1.4 External information is collated and assessed, in accordance with workplace procedures
	1.5 Probable cause of power generation system shutdown is identified from available information and resources, in accordance with workplace procedures
	1.6 Communication with key stakeholders is established, in accordance with workplace procedures
	1.7 Roles and work tasks are identified, in accordance with workplace procedures and in consultation with appropriate personnel
2 Restore system/network generation	**2.1** Power generation system restart response is managed, in accordance with workplace procedures and site requirements
	2.2 Power generation system restart responses are prioritised, in accordance with workplace procedures
	2.3 Contingency management plan including power generation system restart is actioned, in accordance with workplace policies and procedures
	2.4 Additional resources are coordinated and directed, as required, in accordance with workplace procedures
	2.5 Restart plans are monitored, evaluated and adjusted, as

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		required, in accordance with workplace procedures
3 Document work	**3.1**	Equipment failure or system restart problems are recorded and processed, in accordance with workplace procedures
	3.2	Feedback from key stakeholders is recorded, in accordance with workplace procedures
	3.3	Reports are generated and distributed to appropriate personnel, in accordance with workplace procedures
	3.4	Alternative restart plans or recommendations are communicated to appropriate personnel, in accordance with workplace procedures

Foundation Skills

Foundation skills essential to performance are explicit in the performance criteria of this unit of competency.

Range of Conditions

Range is restricted to essential operating conditions and any other variables essential to the work environment.

Non-essential conditions may be found in the Companion Volume Implementation Guide.

Unit Mapping Information

This unit replaces and is equivalent to UEPOPS437B Manage system restart.

Links

Companion Volume implementation guides are found in VETNet - https://vetnet.gov.au/Pages/TrainingDocs.aspx?q=1715b9fa-e7bd-441c-bb8d-cf22c9c825a8

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Assessment Requirements for UEPOPS437 Manage system restart

Modification History

Release 1. This is the first release of this unit of competency in the UEP Generation Training Package.

Performance Evidence

Evidence required to demonstrate competence in this unit must be relevant to and satisfy all the requirements of the elements, performance criteria and range of conditions on at least two separate occasions and includes:

- applying Work, Health and Safety (WHS)/Occupational Health and Safety (OHS) requirements including
  - emergency procedures
  - risk control measures
  - safe working practices
- communicating with key stakeholders
- communicating with personnel and key stakeholders
- determining corrective actions using diagnostic techniques
- documenting completed work using recording procedures
- identifying power generation system restart cause
- implementing legislation, industry standards, codes of practice and regulations
- interpreting manufacturers' specifications and manuals
- locating power generating plant and equipment
- maintaining power generator unit integrity
- recognising abnormal power generating plant operating conditions
- recognising power generating plant status including interpreting remote indications of status using data analysis techniques and tools
- restarting and operating power generating plant within design parameters
- restoring power generation system and/or network generation
- using contingency and restarting plans

Knowledge Evidence

Evidence required to demonstrate competence in this unit must be relevant to and satisfy all the requirements of the elements, performance criteria and range of conditions and includes knowledge of:

- abnormal power generating plant operating conditions
- communication with key stakeholders
- contingency and restart plans

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- corrective actions using diagnostic techniques
- equipment and generation system restart prerequisites
- legislation, industry standards, codes of practice and regulations
- manufacturers' specifications and manuals
- power generation plant and equipment, its location and operating parameters
- power generation plant status
- typical arrangements of power production plant including auxiliary plant and plant operation
- WHS/OHS legislated requirements including
  - emergency procedures
  - risk control measures
  - safe working practices
- workplace documentation
- workplace policies and procedures

Assessment Conditions

As a minimum, assessors must satisfy applicable regulatory requirements, which include requirements in the Standards for Registered Training Organisations current at the time of assessment.

As a minimum, assessment must satisfy applicable regulatory requirements, which include requirements in the Standards for Registered Training Organisations current at the time of assessment.

Assessment processes and techniques must be appropriate to the language, literacy and numeracy requirements of the work being performed and the needs of the candidate.

Assessment must occur in workplace operational situations. Where this is not appropriate, assessment must occur in simulated workplace operational situations that reflect workplace conditions.

Resources for assessment must include access to:

- a range of relevant exercises, case studies and/or other simulations
- relevant and appropriate materials, tools, equipment and personal protective equipment currently used in industry
- applicable documentation including workplace procedures, industry standards, equipment specifications, regulations, codes of practice and operation manuals.

Links

Companion Volume implementation guides are found in VETNet - https://vetnet.gov.au/Pages/TrainingDocs.aspx?q=1715b9fa-e7bd-441c-bb8d-cf22c9c825a8

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UEPOPS439 Plan and organise work

Modification History

Release 1. This is the first release of this unit of competency in the UEP Generation Training Package.

Application

This unit involves the skills and knowledge required to undertake the planning and organising of work tasks to be undertaken by a workplace team.

Planning and organising work activities requires tasks to be identified, the development of a plan and the organisation of tasks that are assigned to team members.

Competency in this unit requires the ability to plan and prepare work, coordinate and allocate work tasks to the team, the completion of work documentation and the reporting on status of completion. Individuals will, in general, work as an operator, in a power generation facility.

Power generation plant operators are typically trained and authorised to isolate, prepare plant and issue permits to work.

No licensing, legislative or certification requirements apply to this unit at the time of publication.

Note: Workplace practice

The application of the skills and knowledge described in this unit may require a licence or training permit to practice in the workplace where work is carried out on gas and electrical installations. Additional conditions may apply under state and territory legislative and regulatory licensing requirements.

Pre-requisite Unit

There are no prerequisite units.

Competency Field

Operations

Unit Sector

Electricity generation

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Elements and Performance Criteria

ELEMENTS	PERFORMANCE CRITERIA
Elements describe the essential outcomes.	Performance criteria describe the performance needed to demonstrate achievement of the element.
1 Plan and prepare for work	**1.1** Work requirements, including permits, are identified from work orders and are confirmed with appropriate personnel and site inspection, in accordance with workplace procedures
	1.2 Work, Health and Safety (WHS)/Occupational Health and Safety (OHS) regulations, industry standards, legislative requirements, codes of practice, manufacturers' specifications, environmental obligations and workplace procedures are identified, applied and monitored
	1.3 Materials, equipment and resources to satisfy team tasks are obtained and inspected for compliance with job specifications, in accordance with workplace procedures
	1.4 Team work is planned, in accordance with workplace procedures, using appropriate plans, drawings, manuals and industry standards
2 Coordinate work	**2.1** Tasks are assigned and monitored to ensure compliance with plans and work requirements, in accordance with workplace procedures
	2.2 Provision for recycling or reuse of materials is undertaken, where possible, in accordance with workplace procedures
	2.3 Work tasks are modified to meet unforeseen circumstances and any changes are communicated promptly, in accordance with workplace procedures
3 Complete work	**3.1** Finalisation of work and restoration of site is monitored, in accordance with workplace procedures
	3.2 Permits are signed off and appropriate personnel are notified of work completion, in accordance with workplace procedures
	3.3 Work records, costing data and reports are prepared and finalised, in accordance with workplace procedures

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Foundation Skills

Foundation skills essential to performance are explicit in the performance criteria of this unit of competency.

Range of Conditions

Range is restricted to essential operating conditions and any other variables essential to the work environment.

Non-essential conditions may be found in the Companion Volume Implementation Guide.

Unit Mapping Information

This unit replaces and is equivalent to UEPOPS439B Plan and organise work.

Links

Companion Volume implementation guides are found in VETNet - https://vetnet.gov.au/Pages/TrainingDocs.aspx?q=1715b9fa-e7bd-441c-bb8d-cf22c9c825a8

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Assessment Requirements for UEPOPS439 Plan and organise work

Modification History

Release 1. This is the first release of this unit of competency in the UEP Generation Training Package.

Performance Evidence

Evidence required to demonstrate competence in this unit must be relevant to and satisfy all the requirements of the elements, performance criteria and range of conditions on at least two separate occasions and includes:

- applying Work, Health and Safety (WHS)/Occupational Health and Safety (OHS) legislated requirements including:
  - emergency procedures
  - risk control measures
  - safe working practices
- communicating information to personnel
- communicating with personnel
- developing and implementing team work plans
- employing resource planning techniques
- estimating materials and resource requirements
- implementing legislation, industry standards, codes of practice and regulations
- interpreting manufacturers' specifications and manuals
- modifying work plans
- monitoring team performance
- submitting and working with permits to work
- using recording procedures

Knowledge Evidence

Evidence required to demonstrate competence in this unit must be relevant to and satisfy all the requirements of the elements, performance criteria and range of conditions and includes knowledge of:

- legislation, industry standards, codes of practice and regulations
- manufacturers' specifications and manuals
- permit to work system and processes
- plant drawings
- power generation plant and equipment, its location and operating parameters

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- resource planning techniques
- WHS/OHS legislation requirements including:
  - emergency procedures
  - risk control measures
  - safe working practices
- work plans for teams
- workplace documentation
- workplace policies and procedures

Assessment Conditions

As a minimum, assessors must satisfy applicable regulatory requirements, which include requirements in the Standards for Registered Training Organisations current at the time of assessment.

As a minimum, assessment must satisfy applicable regulatory requirements, which include requirements in the Standards for Registered Training Organisations current at the time of assessment.

Assessment processes and techniques must be appropriate to the language, literacy and numeracy requirements of the work being performed and the needs of the candidate.

Assessment must occur in workplace operational situations. Where this is not appropriate, assessment must occur in simulated workplace operational situations that reflect workplace conditions.

Resources for assessment must include access to:

- a range of relevant exercises, case studies and/or other simulations
- relevant and appropriate materials, tools, equipment and personal protective equipment currently used in industry
- applicable documentation including workplace procedures, industry standards, equipment specifications, regulations, codes of practice and operation manuals.

Links

Companion Volume implementation guides are found in VETNet - https://vetnet.gov.au/Pages/TrainingDocs.aspx?q=1715b9fa-e7bd-441c-bb8d-cf22c9c825a8

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UEPOPS440 Coordinate team activities

Modification History

Release 1. This is the first release of this unit of competency in the UEP Generation Training Package.

Application

This unit involves the skills and knowledge required to direct and coordinate team activities in the workplace to achieve agreed goals.

Team coordination is the process of turning a group of individuals into a cohesive team where they work together interdependently and cooperatively to meet the needs of the workplace.

Competency in this unit requires the ability to prepare for team work, coordinate team work and conduct team meetings. Individuals will, in general, work as a coordinator, in a power generation facility.

Power generation plant operators are typically trained and authorised to isolate, prepare plant and issue permits to work.

No licensing, legislative or certification requirements apply to this unit at the time of publication.

Note: Workplace practice

The application of the skills and knowledge described in this unit may require a licence or training permit to practice in the workplace where work is carried out on gas and electrical installations. Additional conditions may apply under state and territory legislative and regulatory licensing requirements.

Pre-requisite Unit

There are no prerequisite units.

Competency Field

Operations

Unit Sector

Electricity generation

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Elements and Performance Criteria

ELEMENTS	PERFORMANCE CRITERIA
Elements describe the essential outcomes.	Performance criteria describe the performance needed to demonstrate achievement of the element.
1 Prepare for team work	**1.1** Work, Health and Safety (WHS)/Occupational Health and Safety (OHS) regulations, legislative requirements, industry standards, codes of practice, environmental obligations and workplace procedures are identified, applied and monitored
	1.2 Team work is planned, in accordance with workplace procedures
	1.3 Hazards or incidents related to performance of team work are identified and investigated and remedial action is planned and implemented, in accordance with workplace procedures and legislative requirements
	1.4 Team communication requirements are identified, in accordance with workplace procedures
	1.5 Communication and information systems are used, in accordance with workplace procedures
2 Coordinate team work	**2.1** Site or team performance goals are identified and clarified with team members, in accordance with workplace procedures
	2.2 Cooperative interaction between team members is fostered, in accordance with workplace procedures
	2.3 Team roles are identified and coordinated, in accordance with workplace procedures
	2.4 Work plans for the team are developed, revised and coordinated, in accordance with workplace procedures
	2.5 Proposals for improvements are encouraged from team members, in accordance with workplace procedures
	2.6 Barriers to achievement of team goals and performance are identified and resolved, or referred to appropriate personnel, in accordance with workplace procedures
3 Conduct team meetings	**3.1** Team meeting objectives are clarified, and research is prepared, in accordance with workplace procedures

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3.2 Meeting procedures are conveyed to team members, in accordance with workplace procedures

3.3 Formal presentations are undertaken in team meetings, in accordance with workplace procedures

3.4 Team members are encouraged to participate and are given a hearing in meetings, in accordance with workplace procedures

Foundation Skills

Foundation skills essential to performance are explicit in the performance criteria of this unit of competency.

Range of Conditions

Range is restricted to essential operating conditions and any other variables essential to the work environment.

Non-essential conditions may be found in the Companion Volume Implementation Guide.

Unit Mapping Information

This unit replaces and is equivalent to UEPOPS440B Coordinate team activities.

Links

Companion Volume implementation guides are found in VETNet - https://vetnet.gov.au/Pages/TrainingDocs.aspx?q=1715b9fa-e7bd-441c-bb8d-cf22c9c825a8

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Assessment Requirements for UEPOPS440 Coordinate team activities

Modification History

Release 1. This is the first release of this unit of competency in the UEP Generation Training Package.

Performance Evidence

Evidence required to demonstrate competence in this unit must be relevant to and satisfy all the requirements of the elements, performance criteria and range of conditions on at least two separate occasions and includes:

- applying Work, Health and Safety (WHS)/Occupational Health and Safety (OHS) requirements including:
  - emergency procedures
  - risk control measures
  - safe working practices
- communicating with team
- conducting team meetings
- coordinating team work
- developing work plans
- implementing legislation, industry standards, codes of practice and regulations
- instigating team goals
- maximising and utilising team potential through interpersonal techniques and skills
- monitoring team activities and resolving team member differences
- preparing for team work
- promoting team unity and providing team support

Knowledge Evidence

Evidence required to demonstrate competence in this unit must be relevant to and satisfy all the requirements of the elements, performance criteria and range of conditions and includes knowledge of:

- communication techniques and procedures
- coordination of work teams
- dispute resolution procedures
- interpersonal techniques and skills
- legislation, industry standards, codes of practice and regulations
- management of team meetings

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- team member competency and skill identification
- techniques for team goal setting
- WHS/OHS legislated requirements including:
  - emergency procedures
  - risk control measures
  - safe working practices
- work plans
- workplace documentation
- workplace policies and procedures

Assessment Conditions

As a minimum, assessors must satisfy applicable regulatory requirements, which include requirements in the Standards for Registered Training Organisations current at the time of assessment.

As a minimum, assessment must satisfy applicable regulatory requirements, which include requirements in the Standards for Registered Training Organisations current at the time of assessment.

Assessment processes and techniques must be appropriate to the language, literacy and numeracy requirements of the work being performed and the needs of the candidate.

Assessment must occur in workplace operational situations. Where this is not appropriate, assessment must occur in simulated workplace operational situations that reflect workplace conditions.

Resources for assessment must include access to:

- a range of relevant exercises, case studies and/or other simulations
- relevant and appropriate materials, tools, equipment and personal protective equipment currently used in industry
- applicable documentation including workplace procedures, industry standards, equipment specifications, regulations, codes of practice and operation manuals

Links

Companion Volume implementation guides are found in VETNet - https://vetnet.gov.au/Pages/TrainingDocs.aspx?q=1715b9fa-e7bd-441c-bb8d-cf22c9c825a8

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UEPOPS441 Operate and monitor system equipment

Modification History

Release 1. This is the first release of this unit of competency in the UEP Generation Training Package.

Application

This unit involves the skills and knowledge required to operate, monitor and control High Voltage (H.V.) apparatus on the system via SCADA control.

Supervisory Control and Data Acquisition (SCADA) is a control system that uses computers, networked data communications and graphic interfaces. It uses other peripheral devices such as programmable logic controllers and discrete proportional integral derivative controllers to interface with plant, equipment or machinery.

Competency in this unit requires the ability to plan work, operate system equipment, monitor system equipment, analyse system equipment faults and complete all documentation. Individuals will, in general, work under supervision, in a power generation facility as an operator.

Power generation plant operators are typically trained and authorised to isolate, prepare plant and issue permits to work.

No licensing, legislative or certification requirements apply to this unit at the time of publication.

Note: Workplace practice

The application of the skills and knowledge described in this unit may require a licence or training permit to practice in the workplace where work is carried out on gas and electrical installations. Additional conditions may apply under state and territory legislative and regulatory licensing requirements.

Pre-requisite Unit

There are no prerequisite units.

Competency Field

Operations

Unit Sector

Electricity generation

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Elements and Performance Criteria

ELEMENTS	PERFORMANCE CRITERIA
Elements describe the essential outcomes.	Performance criteria describe the performance needed to demonstrate achievement of the element.
1 Plan and prepare work	**1.1** Safety issues related to operating and monitoring system and/or network High Voltage (H.V.) apparatus through Supervisory Control and Data Acquisition (SCADA) is identified, in accordance with workplace procedures and Work, Health and Safety (WHS)/Occupational Health and Safety (OHS) regulations and legislative requirements
	1.2 System and/or network requirements for operating, monitoring and controlling H.V. apparatus through SCADA are identified from appropriate personnel and documentation, in accordance with workplace procedures
	1.3 System and/or network and associated H.V. apparatus and SCADA equipment operational prerequisites are identified and established, in accordance with workplace and manufacturers' procedures
	1.4 Sequence for recommissioning of system and/or network H.V. apparatus and equipment through SCADA is identified and determined, in accordance with workplace procedures
2 Operate system/network equipment	**2.1** System and/or network equipment and SCADA programs are operated, in accordance with workplace procedures
	2.2 Load shedding requirements are identified, selected and monitored, in accordance with workplace procedures, during equipment operations to ensure system integrity
	2.3 System and/or network operations are completed in consultation with appropriate personnel
3 Monitor system/network equipment	**3.1** Voltage and current requirements are assessed, evaluated and controlled to maintain system/network equipment integrity and stability, in accordance with workplace procedures
	3.2 System and/or network equipment is monitored for normal operations or to detect deviations, in accordance

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		with workplace procedures
	3.3	Corrective actions to rectify system and/or network abnormalities are taken, in accordance with workplace procedures
	3.4	Appropriate personnel are notified when system and/or network equipment defects or abnormal operating conditions are detected, in accordance with workplace procedures
4 Analyse system/network equipment faults	**4.1**	Cause of system equipment operating faults are identified by analysing technical and operational information, in accordance with workplace procedures
	4.2	Operation of protection system is identified and assessed, in accordance with workplace procedures, to evaluate nature and cause of fault conditions
	4.3	Communication is established with key stakeholders, in accordance with workplace procedures, to identify nature and source of equipment system fault or failure
	4.4	Corrective action is taken, in accordance with workplace procedures
	4.5	Network and/or system integrity and personnel safety are maintained, in accordance with workplace procedures, and in consultation with appropriate personnel technical and operational documentation including contingency plans
5 Complete documentation	**5.1**	Equipment problems, movements, and status are reported, in accordance with workplace procedures
	5.2	Documentation is updated, in accordance with workplace procedures

Foundation Skills

Foundation skills essential to performance are explicit in the performance criteria of this unit of competency.

Range of Conditions

Range is restricted to essential operating conditions and any other variables essential to the work environment.

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Non-essential conditions may be found in the Companion Volume Implementation Guide.

Unit Mapping Information

This unit replaces and is equivalent to UEPOPS441B Operate and monitor system equipment.

Links

Companion Volume implementation guides are found in VETNet - https://vetnet.gov.au/Pages/TrainingDocs.aspx?q=1715b9fa-e7bd-441c-bb8d-cf22c9c825a8

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Assessment Requirements for UEPOPS441 Operate and monitor system equipment

Modification History

Release 1. This is the first release of this unit of competency in the UEP Generation Training Package.

Performance Evidence

Evidence required to demonstrate competence in this unit must be relevant to and satisfy all the requirements of the elements, performance criteria and range of conditions on at least two separate occasions and includes:

- analysing system equipment faults using data analysis techniques and tools
- applying Work, Health and Safety (WHS)/Occupational Health and Safety (OHS) requirements including:
  - emergency procedures
  - risk control measures
  - safe working practices
- communicating with personnel
- completing documentation using recording procedures
- implementing legislation, industry standards, codes of practice and regulations
- interpreting manufacturers' specifications and manuals
- monitoring system equipment and identifying status
- operating screen based equipment
- operating, monitoring and controlling High Voltage (H.V.) apparatus through use of Supervisory Control and Data Acquisition (SCADA)
- planning and preparing work
- recognising and responding to abnormal system equipment operating conditions

Knowledge Evidence

Evidence required to demonstrate competence in this unit must be relevant to and satisfy all the requirements of the elements, performance criteria and range of conditions and includes knowledge of:

- legislation, industry standards, codes of practice and regulations
- manufacturers' specifications
- operation of Supervisory Control and Data Acquisition (SCADA)
- system equipment including its location, operating parameters and status
- typical arrangements of power production plant
- WHS/OHS legislated requirements including:

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  - emergency procedures
  - risk control measures
  - safe working practices
- workplace documentation
- workplace policies and procedures

Assessment Conditions

As a minimum, assessors must satisfy applicable regulatory requirements, which include requirements in the Standards for Registered Training Organisations current at the time of assessment.

As a minimum, assessment must satisfy applicable regulatory requirements, which include requirements in the Standards for Registered Training Organisations current at the time of assessment.

Assessment processes and techniques must be appropriate to the language, literacy and numeracy requirements of the work being performed and the needs of the candidate.

Assessment must occur in workplace operational situations. Where this is not appropriate, assessment must occur in simulated workplace operational situations that reflect workplace conditions.

Resources for assessment must include access to:

- a range of relevant exercises, case studies and/or other simulations
- relevant and appropriate materials, tools, equipment and personal protective equipment currently used in industry
- applicable documentation including workplace procedures, industry standards, equipment specifications, regulations, codes of practice and operation manuals.

Links

Companion Volume implementation guides are found in VETNet - https://vetnet.gov.au/Pages/TrainingDocs.aspx?q=1715b9fa-e7bd-441c-bb8d-cf22c9c825a8

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UEPOPS442 Monitor and coordinate the operation of a combined cycle gas turbine unit

Modification History

Release 1. This is the first release of this unit of competency in the UEP Generation Training Package.

Application

This unit involves the skills and knowledge required to simultaneously operate and monitor combined cycle power generation plant. It involves the safe and effective management of energy production to meet demand using a combined cycle gas turbine unit.

Combined cycle plant typically consists of a gas turbine and associated generator, Heat Recovery Steam Generator (HRSG), steam turbine and associated generator. Combined cycle power plant uses both the gas and steam turbines together to produce more electricity from the same fuel.

Competency in this unit requires the ability to plan for plant operation, operate heat recovery steam generator, operate generator and excitation system, control generation of electrical energy, coordinate unit operations, monitor system/plant, test system/plant operation, analyse system/plant faults and complete all documentation. Individuals will, in general, work as an operator, in a power generation facility.

Power generation plant operators are typically trained and authorised to isolate, prepare plant and issue permits to work.

No licensing, legislative or certification requirements apply to this unit at the time of publication.

Note: Workplace practice

The application of the skills and knowledge described in this unit may require a licence or training permit to practice in the workplace where work is carried out on gas and electrical installations. Additional conditions may apply under state and territory legislative and regulatory licensing requirements.

Pre-requisite Unit

UEPOPS314 Operate and monitor fuel firing plant (gas or oil)

UEPOPS333 Operate and monitor HRSG hot gas control system

UEPOPS336 Operate and monitor gas turbine unit

UEPOPS340 Operate and monitor a steam turbine

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Competency Field

Operations

Unit Sector

Electricity generation

Elements and Performance Criteria

ELEMENTS	PERFORMANCE CRITERIA
Elements describe the essential outcomes.	Performance criteria describe the performance needed to demonstrate achievement of the element.
1 Plan for plant operation	**1.1** Safety issues, including Work, Health and Safety (WHS)/Occupational Health and Safety (OHS) regulations, are identified, in accordance with workplace procedures and site requirements
	1.2 Work, combined cycle plant and resource requirements are identified from relevant information and documentation, in accordance with workplace procedures
	1.3 Preoperational checks are carried out on combined cycle plant, in accordance with workplace procedures and site requirements
2 Operate heat recovery steam generator	**2.1** Gas turbine exhaust, gas flow and power output are adjusted to achieve required steam flow and conditions, in accordance with workplace procedures and operating requirements
	2.2 Supplementary firing system is placed into and out of service, as required, in accordance with workplace procedures, to maintain steam flow and steam conditions
	2.3 Combined cycle plant is operated within limits of its design, in accordance with workplace procedures and site requirements
	2.4 Combined cycle plant is operated, monitored and observed, in accordance with workplace procedures, to detect deviations from required operating conditions
	2.5 Corrective action is taken to rectify abnormalities in combined cycle plant, in accordance with manufacturers'

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		specifications and workplace procedures
3 Operate generator and excitation system	**3.1**	Generator and excitation system is operated, in accordance with workplace procedures and manufacturer's operating recommendations
	3.2	Synchronising requirements are assessed, evaluated and implemented, in accordance with workplace procedures, to ensure generator and excitation system stability
	3.3	Generator and excitation system is monitored and observed, in accordance with workplace procedures, to detect deviations from normal operating conditions
	3.4	Corrective actions are taken to rectify generator and excitation system abnormalities, in accordance with workplace procedures and manufacturers' recommendations
4 Control generation of electrical energy	**4.1**	Generator output is adjusted to meet demand, in accordance with workplace procedures, whilst observing operating requirements
	4.2	Reactive power generation and voltage regulation requirements are assessed, in accordance with workplace procedures, to ensure the generator and excitation system is controlled to achieve desired output
	4.3	Generator stabilities and operating limits are assessed and the generator and excitation system is controlled to maintain those limits, in accordance with workplace procedures and manufacturers' recommendations
	4.4	Generator cooling systems and limits are monitored and assessed, and excitation system is controlled to maintain those limits, in accordance with workplace procedures and manufacturers' recommendation
5 Coordinate generator and excitation system operations	**5.1**	Generator and excitation systems are operated, in accordance with workplace procedures, to meet workplace requirements whilst observing power generating plant limitations
	5.2	Generator and excitation systems are monitored and observed, in accordance with workplace procedures, to detect deviations from normal operating conditions
	5.3	Causes of abnormal generator and excitation system operating conditions are identified by analysing technical and operational data and information, in

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		accordance with workplace procedures
	5.4	Corrective action is taken to rectify generator and excitation system abnormalities, in accordance with workplace procedures and site requirements
	5.5	Generator and excitation system integrity, personnel safety and continuity of supply are maintained, in accordance with workplace procedures
	5.6.	Consultation with appropriate personnel is undertaken, in accordance with workplace procedures and site requirements
	5.7	Generator and excitation system is operated at optimum efficiency, in accordance with workplace procedures
6 Monitor system/plant	**6.1**	Generator and excitation system and combined cycle plant to be monitored is physically identified, in accordance with workplace procedures
	6.2	Generator and excitation system and combined cycle plant is monitored for normal operation to detect deviations, in accordance with workplace procedures
	6.3	Corrective action is taken, in accordance with workplace procedures
	6.4	Appropriate personnel are notified, in accordance with workplace procedures, when defects and abnormal operating conditions are detected
7 Test system/plant operation	**7.1**	Operational tests are performed, in accordance with workplace procedures
	7.2	Generator and excitation system and combined cycle plant is observed for correct operational response, in accordance with workplace procedures
	7.3	Corrective action is taken, in accordance with workplace procedures, when response does not meet documentation, combined cycle plant and generator and excitation system integrity or personnel safety requirements
	7.4	Generator and excitation system and combined cycle plant is returned to required operational status, in accordance with workplace procedures, upon completion of testing

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8	**Analyse system/plant faults**	**8.1** Causes of abnormal generator and excitation system operating conditions are identified, in accordance with workplace procedures, by analysing technical and operational information
		8.2 Corrective actions to rectify faults are determined, in accordance with workplace procedures
		8.3 Generator and excitation system and combined cycle plant integrity and personnel safety are maintained, in accordance with workplace procedures, and in consultation with appropriate personnel and technical and operational documentation
		8.4 Appropriate personnel are organised, in accordance with workplace procedures for investigation of identified operational abnormalities
9	**Complete documentation**	**9.1** Combined cycle plant problems, movements, and status are reported, in accordance with workplace procedures
		9.2 Documentation is updated, in accordance with workplace procedures

Foundation Skills

Foundation skills essential to performance are explicit in the performance criteria of this unit of competency.

Range of Conditions

Range is restricted to essential operating conditions and any other variables essential to the work environment.

Non-essential conditions may be found in the Companion Volume Implementation Guide.

Unit Mapping Information

This unit replaces and is equivalent to UEPOPS442B Monitor and coordinate the operation of a combined cycle gas turbine unit.

Links

Companion Volume implementation guides are found in VETNet - https://vetnet.gov.au/Pages/TrainingDocs.aspx?q=1715b9fa-e7bd-441c-bb8d-cf22c9c825a8

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Assessment Requirements for UEPOPS442 Monitor and coordinate the operation of a combined cycle gas turbine unit

Modification History

Release 1. This is the first release of this unit of competency in the UEP Generation Training Package.

Performance Evidence

Evidence required to demonstrate competence in this unit must be relevant to and satisfy all the requirements of the elements, performance criteria and range of conditions on at least two separate occasions and includes:

- analysing generator and excitation system and/or combined cycle plant for faults using data analysis techniques and tools
- applying Work, Health and Safety (WHS)/Occupational Health and Safety (OHS) requirements including
  - emergency procedures
  - risk control measures
  - safe working practices
- communicating with personnel
- controlling power generation operations of combined cycle plant and equipment
- coordinating operation of interacting generator and excitation systems
- identifying combined cycle plant status
- implementing legislation, industry standards, codes of practice and regulations
- interpreting manufacturers' specifications and manuals
- maintaining generator unit integrity
- monitoring generator and excitation system and/or combined cycle plant
- operating heat recovery steam generator
- organising resources
- planning for combined cycle plant operation
- preparing combined cycle plant and/or equipment for operation
- responding to abnormal combined cycle plant operating conditions
- testing generator and excitation system and/or combined cycle plant operation using diagnostic and testing techniques
- working with permit to work system

Knowledge Evidence

Evidence required to demonstrate competence in this unit must be relevant to and satisfy all the requirements of the elements, performance criteria and range of conditions and includes

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knowledge of:

- combined cycle plant and equipment, its location and operating parameters
- combined cycle plant status
- combined cycle system components and interactions including generator and system stability
- legislation, industry standards, codes of practice and regulations
- manufacturers' specifications and manuals
- permit to work system
- potential resources
- steam and gas turbines and generators
- types and characteristics of heat recovery steam generators
- typical arrangements of power production plant
- WHS/OHS legislated requirements including
  - emergency procedures
  - risk control measures
  - safe working practices
- workplace documentation
- workplace policies and procedures

Assessment Conditions

As a minimum, assessors must satisfy applicable regulatory requirements, which include requirements in the Standards for Registered Training Organisations current at the time of assessment.

As a minimum, assessment must satisfy applicable regulatory requirements, which include requirements in the Standards for Registered Training Organisations current at the time of assessment.

Assessment processes and techniques must be appropriate to the language, literacy and numeracy requirements of the work being performed and the needs of the candidate.

Assessment must occur in workplace operational situations. Where this is not appropriate, assessment must occur in simulated workplace operational situations that reflect workplace conditions.

Resources for assessment must include access to:

- a range of relevant exercises, case studies and/or other simulations
- relevant and appropriate materials, tools, equipment and personal protective equipment currently used in industry
- applicable documentation including workplace procedures, industry standards, equipment specifications, regulations, codes of practice and operation manuals.

Links

Companion Volume implementation guides are found in VETNet - https://vetnet.gov.au/Pages/TrainingDocs.aspx?q=1715b9fa-e7bd-441c-bb8d-cf22c9c825a8

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UEPOPS443 Coordinate wind farm operations

Modification History

Release 1. This is the first release of this unit of competency in the UEP Generation Training Package.

Application

This unit involves the skills and knowledge required to coordinate the safe management of energy production at a wind farm.

A wind farm consists of a group of wind turbines in the same location used to produce electricity. Turbines at a wind farm are typically interconnected, with a substation transformer used to send the power to its grid destination.

Competency in this unit requires the ability to plan for plant operation, monitor wind farm operations, control wind farm electrical energy production, test wind farm operation, analyse system or plant faults and the completion of all documentation. Individuals will, in general, work as an operator at a wind farm with responsibilities for coordination activities.

Power generation plant operators are typically trained and authorised to isolate, prepare plant and issue permits to work.

No licensing, legislative or certification requirements apply to this unit at the time of publication.

Note: Workplace practice

The application of the skills and knowledge described in this unit may require a licence or training permit to practice in the workplace where work is carried out on gas and electrical installations. Additional conditions may apply under state and territory legislative and regulatory licensing requirements.

Pre-requisite Unit

There are no prerequisite units.

Competency Field

Operations

Unit Sector

Electricity generation

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Elements and Performance Criteria

ELEMENTS	PERFORMANCE CRITERIA
Elements describe the essential outcomes.	Performance criteria describe the performance needed to demonstrate achievement of the element.
1 Plan for plant operation	**1.1** Safety issues are identified, in accordance with workplace procedures, to comply with Work, Health and Safety (WHS)/Occupational Health and Safety (OHS) requirements
	1.2 Work and wind farm plant and resource requirements are identified, in accordance with workplace procedures, from relevant information and documentation
	1.3 Preoperational checks of wind farm plant and equipment are carried out, in accordance with workplace procedures
2 Monitor wind farm operations	**2.1** Wind turbines and equipment are monitored for normal operation, in accordance with workplace procedures
	2.2 Alarms are acknowledged, prioritised and responded to, in accordance with workplace procedures
	2.3 Deviations from wind farm operations are identified and corrective actions are taken, in accordance with workplace procedures
	2.4 Wind farm plant and equipment use is monitored in key areas and trends in problems are identified, in accordance with workplace procedures
3 Control wind farm electrical energy production	**3.1** Wind farm energy output is controlled, in accordance with workplace procedures, to meet operational or load requirements of power generation facility
	3.2 Wind turbines are manually adjusted to meet operation requirements, in accordance with workplace procedures and manufacturers' recommendations
	3.3 Wind turbines are taken out of service and are shut down to meet operational and maintenance requirements, in accordance with workplace procedures and manufacturers' recommendations
	3.4 Wind turbines are run-up and placed into service to meet operational requirements, in accordance with workplace

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		procedures and manufacturers' recommendations
	3.5	Appropriate personnel are notified, in accordance with workplace procedures, when wind turbine defects and abnormal operating conditions are detected
4 Test wind farm operation	**4.1**	Wind farm operational tests are performed, in accordance with workplace procedures
	4.2	Wind farm system and plant is observed for correct operational response, in accordance with workplace procedures
	4.3	Corrective action is taken, in accordance with workplace procedures, when response does not meet with documentation, wind farm plant and system integrity or personnel safety requirements
	4.4	Wind farm system and plant is returned to required operational status, in accordance with workplace procedures, upon completion of test
5 Analyse wind farm system and plant faults	**5.1**	Causes of abnormal wind farm system operating conditions are identified, in accordance with workplace procedures, by analysing technical and operational information
	5.2	Corrective actions to rectify faults are determined, in accordance with workplace procedures
	5.3	Wind farm system and plant integrity and personnel safety are maintained, in accordance with workplace procedures, through consultation with personnel and technical and operational documentation
	5.4	Appropriate personnel, including specialists, are arranged, in accordance with workplace procedures, for investigation of identified operational wind farm abnormalities
6 Complete documentation	**6.1**	Wind farm plant problems, movements and status are reported, in accordance with workplace procedures
	6.2	Documentation is updated, in accordance with workplace procedures

Foundation Skills

Foundation skills essential to performance are explicit in the performance criteria of this unit of

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competency.

Range of Conditions

Range is restricted to essential operating conditions and any other variables essential to the work environment.

Non-essential conditions may be found in the Companion Volume Implementation Guide.

Unit Mapping Information

This unit replaces and is equivalent to UEPOPS443A Coordinate Wind Farm Operations.

Links

Companion Volume implementation guides are found in VETNet - https://vetnet.gov.au/Pages/TrainingDocs.aspx?q=1715b9fa-e7bd-441c-bb8d-cf22c9c825a8

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Assessment Requirements for UEPOPS443 Coordinate wind farm operations

Modification History

Release 1. This is the first release of this unit of competency in the UEP Generation Training Package.

Performance Evidence

Evidence required to demonstrate competence in this unit must be relevant to and satisfy all the requirements of the elements, performance criteria and range of conditions on at least two separate occasions and includes:

- analysing wind farm system and plant faults using data analysis techniques and tools
- applying Work, Health and Safety (WHS)/Occupational Health and Safety (WHS) requirements including:
  - emergency procedures
  - risk control measures
  - safe working practices
- communicating with personnel
- completing documentation using recording procedures
- controlling wind farm electrical energy production
- coordinating wind farm electrical energy generation including:
  - identifying wind farm plant status
  - operating interacting systems
  - running wind farm plant and equipment
- implementing legislation, industry standards, codes of practice and regulations
- interpreting manufacturers' specifications and manuals
- monitoring wind farm operations
- planning for wind farm plant operation
- preparing wind farm plant and equipment for operation
- recognising and responding to abnormal wind farm plant operating conditions
- testing wind farm operation using diagnostic and testing techniques

Knowledge Evidence

Evidence required to demonstrate competence in this unit must be relevant to and satisfy all the requirements of the elements, performance criteria and range of conditions and includes knowledge of:

- legislation, industry standards, codes of practice and regulations

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- manufacturers' specifications and manuals
- typical arrangements of power production plant
- WHS/OHS legislated requirements including:
  - emergency procedures
  - risk control measures
  - safe working practices
- wind farm generator and system stability principles
- wind farm plant and equipment, its location and operating parameters including:
  - wind farm control system types
  - wind farm system components and interactions
  - wind turbine and generator types and characteristics
  - wind turbine support systems
- workplace documentation
- workplace policies and procedures

Assessment Conditions

As a minimum, assessors must satisfy applicable regulatory requirements, which include requirements in the Standards for Registered Training Organisations current at the time of assessment.

As a minimum, assessment must satisfy applicable regulatory requirements, which include requirements in the Standards for Registered Training Organisations current at the time of assessment.

Assessment processes and techniques must be appropriate to the language, literacy and numeracy requirements of the work being performed and the needs of the candidate.

Assessment must occur in workplace operational situations. Where this is not appropriate, assessment must occur in simulated workplace operational situations that reflect workplace conditions.

Resources for assessment must include access to:

- a range of relevant exercises, case studies and/or other simulations
- relevant and appropriate materials, tools, equipment and personal protective equipment currently used in industry
- applicable documentation including workplace procedures, industry standards, equipment specifications, regulations, codes of practice and operation manuals.

Links

Companion Volume implementation guides are found in VETNet - https://vetnet.gov.au/Pages/TrainingDocs.aspx?q=1715b9fa-e7bd-441c-bb8d-cf22c9c825a8

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UEPOPS444 Start and run-up a hydro turbine

Modification History

Release 1. This is the first release of this unit of competency in the UEP Generation Training Package.

Application

This unit involves the skills and knowledge required to conduct safe hydro turbine run-ups to a stable operating condition.

Run up of a hydro turbine will involve the operator making a sequence of checks prior to and during start up. This ensures that loading the turbine is completed in a safe and consistent manner.

Competency in this unit requires the ability plan and prepare hydro turbine, start and run-up hydro turbine, test and analyse hydro turbine system faults and complete documentation. Individuals will, in general, work under supervision, in a power generation facility as an operator.

Power generation plant operators are typically trained and authorised to isolate, prepare plant and issue permits to work.

No licensing, legislative or certification requirements apply to this unit at the time of publication.

Note: Workplace practice

The application of the skills and knowledge described in this unit may require a licence or training permit to practice in the workplace where work is carried out on gas and electrical installations. Additional conditions may apply under state and territory legislative and regulatory licensing requirements.

Pre-requisite Unit

There are no prerequisite units.

Competency Field

Operations

Unit Sector

Electricity generation

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Elements and Performance Criteria

ELEMENTS	PERFORMANCE CRITERIA
Elements describe the essential outcomes.	Performance criteria describe the performance needed to demonstrate achievement of the element.
1 Plan and prepare work	**1.1** Safety issues are identified, in accordance with workplace procedures, Work Health and Safety (WHS)/Occupational Health and Safety (OHS) regulations and legislative requirements
	1.2 Work requirements are identified from relevant personnel and documentation, in accordance with workplace procedures
	1.3 Preoperational checks are carried out on hydro turbine plant, in accordance with manufacturers' recommendations, workplace procedures and site requirements
	1.4 Turbine running up and loading schedule are ascertained from relevant documentation, in accordance with workplace procedures
2 Run-up hydro turbine	**2.1** Hydro turbine and alternator auxiliary systems are started up and hydro turbine is run up, in accordance with manufacturers' specifications and workplace procedures
	2.2 Hydro turbine is monitored and observed to detect deviations from normal run up operating conditions
	2.3 Corrective actions are taken to rectify hydro turbine abnormalities, in accordance with manufacturers' recommendations and workplace procedures
	2.4 Alternator is synchronised and connected to electrical system, in accordance with workplace procedures and manufacturers' recommendations
	2.5 Alternator is loaded, in accordance with workplace procedures, manufacturers' recommendations and regulators requirements
3 Test hydro turbine plant operation	**3.1** Tests are performed, in accordance with workplace procedures
	3.2 Power generation system and hydro turbine plant are observed for correct operational response, in accordance

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		with workplace procedures
4 Analyse and report system faults	**4.1**	Causes of abnormal hydro turbine plant operating conditions are identified, in accordance with workplace procedures by analysing technical and operational information
	4.2	Corrective action is taken, in accordance with workplace procedures
5 Complete documentation	**5.1**	Hydro turbine plant problems, movements and status are reported, in accordance with workplace procedures
	5.2	Documentation is updated, in accordance with workplace procedures

Foundation Skills

Foundation skills essential to performance are explicit in the performance criteria of this unit of competency.

Range of Conditions

Range is restricted to essential operating conditions and any other variables essential to the work environment.

Non-essential conditions may be found in the Companion Volume Implementation Guide.

Unit Mapping Information

This unit replaces and is equivalent to UEPOPS444A Start and run-up a hydro turbine.

Links

Companion Volume implementation guides are found in VETNet - https://vetnet.gov.au/Pages/TrainingDocs.aspx?q=1715b9fa-e7bd-441c-bb8d-cf22c9c825a8

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Assessment Requirements for UEPOPS444 Start and run-up a hydro turbine

Modification History

Release 1. This is the first release of this unit of competency in the UEP Generation Training Package.

Performance Evidence

Evidence required to demonstrate competence in this unit must be relevant to and satisfy all the requirements of the elements, performance criteria and range of conditions on at least two separate occasions and includes:

- applying Work, Health and Safety (WHS)/Occupational Health and Safety (OHS) legislated requirements including:
  - emergency procedures
  - risk control measures
  - safe working practices
- communicating with personnel
- identifying hydro turbine plant status
- implementing legislation, industry standards, codes of practices and regulations
- organising resources
- planning and preparing hydro turbine plant and equipment start and run up operations
- recognising and responding to abnormal plant operating conditions
- testing hydro turbine plant operation using diagnostic and data analysis techniques and tools to determine faults
- using recording procedures to complete documentation monitoring and operating hydro turbine plant and equipment
- working with permit to work system

Knowledge Evidence

Evidence required to demonstrate competence in this unit must be relevant to and satisfy all the requirements of the elements, performance criteria and range of conditions and includes knowledge of:

- hydro turbine system components and their interaction
- legislation, industry standards, codes of practices and regulations
- manufacturers' specifications and manuals
- operational processes of hydro turbine
- permit to work system
- supervision and control system processes of hydro turbine

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- typical arrangements for power generation plant
- WHS/OHS legislation requirements including:
  - emergency procedures
  - risk control measures
  - safe working practices
- workplace documentation
- workplace policies and procedures

Assessment Conditions

As a minimum, assessors must satisfy applicable regulatory requirements, which include requirements in the Standards for Registered Training Organisations current at the time of assessment.

As a minimum, assessment must satisfy applicable regulatory requirements, which include requirements in the Standards for Registered Training Organisations current at the time of assessment.

Assessment processes and techniques must be appropriate to the language, literacy and numeracy requirements of the work being performed and the needs of the candidate.

Assessment must occur in workplace operational situations. Where this is not appropriate, assessment must occur in simulated workplace operational situations that reflect workplace conditions.

Resources for assessment must include access to:

- a range of relevant exercises, case studies and/or other simulations
- relevant and appropriate materials, tools, equipment and personal protective equipment currently used in industry
- applicable documentation including workplace procedures, industry standards, equipment specifications, regulations, codes of practice and operation manuals.

Links

Companion Volume implementation guides are found in VETNet - https://vetnet.gov.au/Pages/TrainingDocs.aspx?q=1715b9fa-e7bd-441c-bb8d-cf22c9c825a8

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UEPOPS445 Shut down a hydro turbine

Modification History

Release 1. This is the first release of this unit of competency in the UEP Generation Training Package.

Application

This unit involves the skills and knowledge required to conduct a shutdown of a hydro turbine to where it can be placed at rest safely.

Shutdown of a hydro turbine will involve the operator making a sequence of checks prior to and during shutdown. This ensures that the shutdown of the turbine is completed in a safe and consistent manner.

Competency in this unit requires the ability plan and prepare hydro turbine shut down, conduct a shutdown, test hydro turbine plant operation during shut down, analyse hydro turbine system faults during shutdown and complete documentation. Individuals will, in general, work under supervision, in a power generation facility as an operator.

Power generation plant operators are typically trained and authorised to isolate, prepare plant and issue permits to work.

No licensing, legislative or certification requirements apply to this unit at the time of publication.

Note: Workplace practice

The application of the skills and knowledge described in this unit may require a licence or training permit to practice in the workplace where work is carried out on gas and electrical installations. Additional conditions may apply under state and territory legislative and regulatory licensing requirements.

Pre-requisite Unit

There are no prerequisite units.

Competency Field

Operations

Unit Sector

Electricity generation

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Elements and Performance Criteria

ELEMENTS	PERFORMANCE CRITERIA
Elements describe the essential outcomes.	Performance criteria describe the performance needed to demonstrate achievement of the element.
1 Plan and prepare work	**1.1** Safety issues are identified, in accordance with workplace procedures and Work, Health and Safety (WHS)/Occupational Health and Safety (OHS) regulations
	1.2 Work requirements are identified from appropriate personnel and documentation, in accordance with workplace procedures
	1.3 Hydro turbine running up and loading schedule are ascertained from documentation, in accordance with workplace procedures
2 Conduct hydro turbine shut down	**2.1** Hydro turbine load is reduced, in accordance with workplace procedures and manufacturers' recommendations
	2.2 Hydro turbine and alternator are removed from the system, in accordance with workplace and manufacturers' operating procedures
3 Test hydro turbine plant operation during shut down	**3.1** Tests are performed, in accordance with workplace procedures
	3.2 Power generation system and hydro turbine plant are observed, in accordance with workplace procedures for correct operational response
4 Analyse system faults during hydro turbine shut down	**4.1** Causes of abnormal hydro turbine plant operating conditions are identified, in accordance with workplace procedures, and by analysing technical and operational information
	4.2 Corrective action is taken, is in accordance with workplace procedures
5 Complete documentation	**5.1** Hydro turbine plant problems, movements and status are reported, in accordance with workplace procedures
	5.2 Documentation is updated, in accordance with workplace procedures

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Foundation Skills

Foundation skills essential to performance are explicit in the performance criteria of this unit of competency.

Range of Conditions

Range is restricted to essential operating conditions and any other variables essential to the work environment.

Non-essential conditions may be found in the Companion Volume Implementation Guide.

Unit Mapping Information

This unit replaces and is equivalent to UEPOPS445A Shut down a hydro turbine.

Links

Companion Volume implementation guides are found in VETNet - https://vetnet.gov.au/Pages/TrainingDocs.aspx?q=1715b9fa-e7bd-441c-bb8d-cf22c9c825a8

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Assessment Requirements for UEPOPS445 Shut down a hydro turbine

Modification History

Release 1. This is the first release of this unit of competency in the UEP Generation Training Package.

Performance Evidence

Evidence required to demonstrate competence in this unit must be relevant to and satisfy all the requirements of the elements, performance criteria and range of conditions on at least two separate occasions and includes:

- applying Work, Health and Safety (WHS)/Occupational Health and Safety (OHS) including:
  - emergency procedures
  - risk control measures
  - safe working practices
- communicating with personnel
- conducting safe and controlled shut down of hydro turbine plant and equipment
- identifying hydro turbine plant status
- implementing legislation, industry standards, codes of practice and regulations
- preparing hydro turbine plant and equipment for operation
- recognising and responding to abnormal plant operating conditions
- testing hydro turbine plant operationally using diagnostic and analysis techniques and to determine faults
- using recording procedures to complete documentation
- working with the permit to work system

Knowledge Evidence

Evidence required to demonstrate competence in this unit must be relevant to and satisfy all the requirements of the elements, performance criteria and range of conditions and includes knowledge of:

- hydro turbine operational processes
- hydro turbine plant and equipment, its location and operating parameters
- hydro turbine plant system components and their interaction
- hydro turbine supervision and control systems
- legislation, industry standards, codes of practice and regulations
- manufacturers' specifications and manuals
- on-line condition monitoring equipment and trends

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- permit to work system
- power generation plant status
- typical arrangements of hydro power production plant
- Work, Health and Safety (WHS)/Occupational Health and Safety (OHS) legislation including:
  - emergency procedures
  - risk mitigation control measures
  - safe working practices
- workplace documentation
- workplace policies and procedures

Assessment Conditions

As a minimum, assessors must satisfy applicable regulatory requirements, which include requirements in the Standards for Registered Training Organisations current at the time of assessment.

As a minimum, assessment must satisfy applicable regulatory requirements, which include requirements in the Standards for Registered Training Organisations current at the time of assessment.

Assessment processes and techniques must be appropriate to the language, literacy and numeracy requirements of the work being performed and the needs of the candidate.

Assessment must occur in workplace operational situations. Where this is not appropriate, assessment must occur in simulated workplace operational situations that reflect workplace conditions.

Resources for assessment must include access to:

- a range of relevant exercises, case studies and/or other simulations
- relevant and appropriate materials, tools, equipment and personal protective equipment currently used in industry
- applicable documentation including workplace procedures, industry standards, equipment specifications, regulations, codes of practice and operation manuals.

Links

Companion Volume implementation guides are found in VETNet - https://vetnet.gov.au/Pages/TrainingDocs.aspx?q=1715b9fa-e7bd-441c-bb8d-cf22c9c825a8

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UEPOPS446 Operate and monitor hydro unit control and protection systems

Modification History

Release 1. This is the first release of this unit of competency in the UEP Generation Training Package.

Application

This unit involves the skills and knowledge required to operate, inspect and monitor a hydro unit control and protection system.

Hydro unit controls and protection systems provide operators with the facilities to control and supervise plant and equipment. Hydro unit control and protection systems help to ensure efficiency in critical applications such as turbine control, energy management and equipment protection.

Competency in this unit requires the ability to plan work, carry out operation of hydro unit control and protection system, test hydro unit control and protection system operation, analyse hydro unit control and protection system faults, inspect and monitor hydro unit control and protection system and the completion of all documentation. Individuals will, in general, work under supervision, as an operator in a power generation facility.

Power generation plant operators are typically trained and authorised to isolate, prepare plant and issue permits to work.

No licensing, legislative or certification requirements apply to this unit at the time of publication.

Note: Workplace practice

The application of the skills and knowledge described in this unit may require a licence or training permit to practice in the workplace where work is carried out on gas and electrical installations. Additional conditions may apply under state and territory legislative and regulatory licensing requirements.

Pre-requisite Unit

There are no prerequisite units

Competency Field

Operations

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Unit Sector

Electricity generation

Elements and Performance Criteria

ELEMENTS	PERFORMANCE CRITERIA
Elements describe the essential outcomes.	Performance criteria describe the performance needed to demonstrate achievement of the element.
1 Plan and prepare work	**1.1** Safety issues related to operating and monitoring hydro unit control and protection systems are identified, in accordance with workplace procedures and Work, Health and Safety (WHS)/Occupational Health and Safety (OHS) regulations and legislative requirements
	1.2 Work tasks, hydro unit control and protection system and type of start requirements are identified, in accordance with workplace procedures, from appropriate personnel and documentation
	1.3 Hydro unit control and protection system run-up and loading schedule are ascertained from relevant documentation, in accordance with workplace procedures and site requirements
	1.4 Inspection, preoperational tests and field preparation for hydro unit control and protection system service are carried out, in accordance with workplace procedures and manufacturers' recommendations
	1.5 Hydro unit control and protection system operational prerequisites are established, in accordance with workplace procedures and manufacturers' recommendations
	1.6 Sequence for recommissioning of hydro unit control and protection system is determined, in accordance with workplace procedures
2 Operate hydro control and protection system	**2.1** Hydro unit control and protection system is adjusted, in accordance with workplace procedures, to achieve operating requirements
	2.2 Hydro unit control and protection system is operated within limits of its' design and site requirements, in accordance with workplace procedures

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	2.3	Hydro unit control and protection system is monitored and observed, in accordance with workplace procedures, to detect deviations from required operating conditions
	2.4	Corrective actions are taken to rectify hydro unit control and protection system abnormalities, in accordance with workplace procedures and manufacturers' recommendations
3 Test hydro unit control and protection system operation	**3.1**	Operational tests are performed, in accordance with workplace procedures
	3.2	Hydro unit control and protection system is observed for correct operational response, in accordance with workplace procedures
4 Analyse hydro unit control and protection system faults	**4.1**	Cause of abnormal hydro unit control and protection system operating conditions are identified, in accordance with workplace procedures, and by analysing technical and operational information
	4.2	Actions to rectify hydro unit control and protection system faults are correctly determined, in accordance with workplace procedures
5 Monitor and inspect hydro unit control and protection system	**5.1**	Hydro unit control and protection system to be monitored and inspected is physically identified, in accordance with workplace procedures
	5.2	Hydro unit control and protection system is monitored and inspected, in accordance with workplace procedures, for normal operation or to detect deviations
6 Complete documentation	**6.1**	Hydro unit control and protection system plant problems, movements, and status are reported in accordance with workplace procedures
	6.2	Documentation is updated, in accordance with workplace procedures

Foundation Skills

Foundation skills essential to performance are explicit in the performance criteria of this unit of competency.

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Range of Conditions

Range is restricted to essential operating conditions and any other variables essential to the work environment.

Non-essential conditions may be found in the Companion Volume Implementation Guide.

Unit Mapping Information

This unit replaces and is equivalent to UEPOPS446A Operate and monitor hydro unit control and protection systems.

Links

Companion Volume implementation guides are found in VETNet - https://vetnet.gov.au/Pages/TrainingDocs.aspx?q=1715b9fa-e7bd-441c-bb8d-cf22c9c825a8

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Assessment Requirements for UEPOPS446 Operate and monitor hydro unit control and protection systems

Modification History

Release 1. This is the first release of this unit of competency in the UEP Generation Training Package.

Performance Evidence

Evidence required to demonstrate competence in this unit must be relevant to and satisfy all the requirements of the elements, performance criteria and range of conditions on at least two separate occasions and includes:

- analysing operational faults using data analysis techniques and tools
- applying Work, Health and Safety (WHS)/Occupational Health and Safety (OHS) requirements including:
  - emergency procedures
  - risk control measures
  - safe working practices
- communicating with personnel
- completing documentation using recording procedures
- identifying and operating hydro unit control and protection system and using operational requirements
- identifying hydro unit control and protection system status
- implementing legislation, industry standards, codes of practice and regulations
- interpreting manufacturers' specifications and manuals
- monitoring and inspecting hydro unit control and protection system operation
- organising resources
- preparing hydro unit control and protection system for operation
- recognising and responding to abnormal hydro unit control and protection system operating conditions
- testing hydro unit control and protection system operationally using diagnostic and test techniques

Knowledge Evidence

Evidence required to demonstrate competence in this unit must be relevant to and satisfy all the requirements of the elements, performance criteria and range of conditions and includes knowledge of:

- hydro unit control and protection system, its location and operating parameters manufacturers' specifications and manuals

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- legislation, industry standards, codes of practice and regulations
- typical arrangements of hydro power production plant including hydro unit control and protection system types and characteristics
- WHS/OHS legislated requirements including:
  - emergency procedures
  - risk control measures
  - safe working practices
- workplace documentation
- workplace policies and procedures

Assessment Conditions

As a minimum, assessors must satisfy applicable regulatory requirements, which include requirements in the Standards for Registered Training Organisations current at the time of assessment.

As a minimum, assessment must satisfy applicable regulatory requirements, which include requirements in the Standards for Registered Training Organisations current at the time of assessment.

Assessment processes and techniques must be appropriate to the language, literacy and numeracy requirements of the work being performed and the needs of the candidate.

Assessment must occur in workplace operational situations. Where this is not appropriate, assessment must occur in simulated workplace operational situations that reflect workplace conditions.

Resources for assessment must include access to:

- a range of relevant exercises, case studies and/or other simulations
- relevant and appropriate materials, tools, equipment and personal protective equipment currently used in industry
- applicable documentation including workplace procedures, industry standards, equipment specifications, regulations, codes of practice and operation manuals

Links

Companion Volume implementation guides are found in VETNet - https://vetnet.gov.au/Pages/TrainingDocs.aspx?q=1715b9fa-e7bd-441c-bb8d-cf22c9c825a8

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UEPOPS447 Coordinate photovoltaic solar power plant operations

Modification History

Release 1. This is the first release of this unit of competency in the UEP Generation Training Package.

Application

This unit involves the skills and knowledge required to undertake the coordination of photovoltaic solar power plant operations.

A photovoltaic solar power plant operation typically consists of a large scale Photovoltaic System (P.V.) system designed for the supply of power into the electricity grid. The solar power source is via photovoltaic modules that convert light directly to electricity.

Competency in this unit requires the ability to coordinate plant operations, monitor plant operations, test plant operations, analyse plant faults and report operation against strategy requirements. Individuals will, in general, work as an operator with responsibility for photovoltaic solar power plant coordination, in a power generation facility.

Power generation plant operators are typically trained and authorised to isolate, prepare plant and issue permits to work.

No licensing, legislative or certification requirements apply to this unit at the time of publication.

Note: Workplace practice

The application of the skills and knowledge described in this unit may require a licence or training permit to practice in the workplace where work is carried out on gas and electrical installations. Additional conditions may apply under state and territory legislative and regulatory licensing requirements.

Pre-requisite Unit

There are no prerequisite units.

Competency Field

Operations

Unit Sector

Electricity generation

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Elements and Performance Criteria

ELEMENTS	PERFORMANCE CRITERIA
Elements describe the essential outcomes.	Performance criteria describe the performance needed to demonstrate achievement of the element.
1 Coordinate plant operations	**1.1** Photovoltaic solar power plant operational procedures are implemented, in accordance with workplace procedures
	1.2 Resources and supplies are coordinated to meet photovoltaic solar power plant requirements, in accordance with workplace procedures
2 Monitor plant operations	**2.1** Deviations from photovoltaic solar power plant operations are identified and recorded, in accordance with workplace procedures
	2.2 Photovoltaic solar power plant operation and condition is monitored, in accordance with workplace procedures and legislative requirements
	2.3 Requirements that may impact on photovoltaic solar power plant operations are monitored, in accordance with workplace procedures
	2.4 Photovoltaic solar power plant operations are monitored to meet legislative, industry and site requirements, in accordance with workplace procedures
3 Test plant operation	**3.1** Operational tests are performed on photovoltaic solar power plant, in accordance with workplace procedures
	3.2 Photovoltaic solar power plant is observed for correct operational response, in accordance with workplace procedures
	3.3 Corrective action is taken, in accordance with workplace procedures, when response does not meet with documentation, photovoltaic solar power plant integrity or personnel safety requirements
	3.4 Photovoltaic solar power plant is returned to required operational status upon completion of testing, in accordance with workplace procedures
4 Analyse plant faults	**4.1** Causes of abnormal photovoltaic solar power plant operating conditions are identified, in accordance with workplace procedures, by analysing technical and

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		operational information
	4.2	Corrective actions to rectify faults are determined, in accordance with workplace procedures
	4.3	Photovoltaic solar power plant integrity and personnel safety are maintained, in accordance with workplace procedures, and through consultation with personnel and technical and operational documentation
	4.4	Appropriate personnel, including specialists, are arranged for investigation of identified photovoltaic solar power plant operational abnormalities, in accordance with workplace procedures
5 Report operation against strategy requirements	**5.1**	Data is collected and processed for review, in accordance with workplace procedures and operational strategy
	5.2	Photovoltaic solar power plant operation or condition is reported, in accordance with workplace procedures and legislative requirements
	5.3	Abnormal photovoltaic solar power plant operating conditions are reported, in accordance with workplace procedures
	5.4	Changes to operational strategy are coordinated, in accordance with workplace procedures

Foundation Skills

Foundation skills essential to performance are explicit in the performance criteria of this unit of competency.

Range of Conditions

Range is restricted to essential operating conditions and any other variables essential to the work environment.

Non-essential conditions may be found in the Companion Volume Implementation Guide.

Unit Mapping Information

This unit replaces and is equivalent to UEPOPS447A Coordinate photovoltaic solar power plant operations.

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Links

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Assessment Requirements for UEPOPS447 Coordinate photovoltaic solar power plant operations

Modification History

Release 1. This is the first release of this unit of competency in the UEP Generation Training Package.

Performance Evidence

Evidence required to demonstrate competence in this unit must be relevant to and satisfy all the requirements of the elements, performance criteria and range of conditions on at least two separate occasions and includes:

- analysing photovoltaic solar power plant faults using data analysis techniques and tools
- applying Work, Health and Safety (WHS)/Occupational Health and Safety (OHS) requirements including:
  - emergency procedures
  - risk control measures
  - safe working practices
- communicating with personnel
- coordinating operational strategies
- coordinating photovoltaic solar power plant operations
- identifying photovoltaic solar power plant status
- implementing legislation, industry standards, codes of practice and regulations
- interpreting manufacturers' specifications and manuals
- monitoring photovoltaic solar power plant operations
- photovoltaic solar power plant generation and systems including operating parameters
- reporting operations against operational strategy requirements using recording procedures
- testing photovoltaic solar power plant operation

Knowledge Evidence

Evidence required to demonstrate competence in this unit must be relevant to and satisfy all the requirements of the elements, performance criteria and range of conditions and includes knowledge of:

- coordination of operational strategies
- data collection and recording techniques
- legislation, industry standards, codes of practice and regulations
- manufacturers' specifications and manuals
- measurement and analysis systems and procedures

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- photovoltaic solar power plant and equipment, its location and operating parameters
- photovoltaic solar power plant efficiency including performance and reliability targets
- photovoltaic solar power plant generation and systems
- photovoltaic solar power plant operating parameters
- typical arrangements of photovoltaic solar power plants
- WHS/OHS legislated requirements including:
  - emergency procedures
  - risk control measures
  - safe working practices
- workplace documentation
- workplace policies and procedures

Assessment Conditions

As a minimum, assessors must satisfy applicable regulatory requirements, which include requirements in the Standards for Registered Training Organisations current at the time of assessment.

As a minimum, assessment must satisfy applicable regulatory requirements, which include requirements in the Standards for Registered Training Organisations current at the time of assessment.

Assessment processes and techniques must be appropriate to the language, literacy and numeracy requirements of the work being performed and the needs of the candidate.

Assessment must occur in workplace operational situations. Where this is not appropriate, assessment must occur in simulated workplace operational situations that reflect workplace conditions.

Resources for assessment must include access to:

- a range of relevant exercises, case studies and/or other simulations
- relevant and appropriate materials, tools, equipment and personal protective equipment currently used in industry
- applicable documentation including workplace procedures, industry standards, equipment specifications, regulations, codes of practice and operation manuals

Links

Companion Volume implementation guides are found in VETNet - https://vetnet.gov.au/Pages/TrainingDocs.aspx?q=1715b9fa-e7bd-441c-bb8d-cf22c9c825a8

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UEPOPS450 Coordinate workplace communication

Modification History

Release 1. This is the first release of this unit of competency in the UEP Generation Training Package.

Application

This unit involves the skills and knowledge required to coordinate workplace communication and meetings.

Workplace communication is the process of exchanging information, both verbal and non-verbal, within a team. Communication fosters working relationships which can improve morale and lead to productivity increases.

Competency in this unit requires the ability to plan and prepare for communication, coordinate team communication, coordinate workplace meetings and represent team views. Individuals will, in general, work as an operator with responsibility for coordinating communications, in a power generation facility.

No licensing, legislative or certification requirements apply to this unit at the time of publication.

Note: Workplace practice

The application of the skills and knowledge described in this unit may require a licence or training permit to practice in the workplace where work is carried out on gas and electrical installations. Additional conditions may apply under state and territory legislative and regulatory licensing requirements.

Pre-requisite Unit

UEPOPS338 Facilitate effective workplace communication

Competency Field

Operations

Unit Sector

Electricity generation

Elements and Performance Criteria

ELEMENTS **PERFORMANCE CRITERIA**

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Elements describe the essential outcomes.	Performance criteria describe the performance needed to demonstrate achievement of the element.
1 Plan and prepare for communication	**1.1** Communication requirements are identified, in accordance with workplace procedures, from analysis of team requirements
	1.2 Workplace communication system is planned and established, in accordance with workplace procedures
	1.3 Workplace communications are monitored and modified, as required, in accordance with workplace procedures
2 Coordinate team communications	**2.1** Forums including briefings, meetings and committees, are scheduled and coordinated, as required, in accordance with workplace procedures
	2.2 Information on workplace communication is coordinated and provided to team members, in accordance with workplace procedures
	2.3 Communication deficiencies are identified and team members are made aware of action required and are informed of remedial options available, in accordance with workplace policies and procedures
	2.4 Team members are encouraged to participate in workplace communication forums, in accordance with workplace policies and procedures
3 Coordinate workplace meetings	**3.1** Meetings are planned and organised, including distribution and clarification of agenda, notification of date, venue and attendees, in accordance with workplace procedures
	3.2 Format and rules of meetings are, established and applied, in accordance with workplace procedures
	3.3 Views of personnel are presented in minutes, in accordance with workplace policies and procedures
	3.4 Meeting outcomes and agreed action plans are recorded, and details of next meeting is confirmed, in accordance with workplace procedures
4 Represent team views	**4.1** Team view is determined, in accordance with workplace procedures, including possible options and acceptable alternatives or compromises prior to a presentation

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4.2 Team view is presented clearly and concisely, in accordance with workplace procedures

4.3 Decisions and outcomes are conveyed to team members, in accordance with workplace procedures

Foundation Skills

Foundation skills essential to performance are explicit in the performance criteria of this unit of competency.

Range of Conditions

Range is restricted to essential operating conditions and any other variables essential to the work environment.

Non-essential conditions may be found in the Companion Volume Implementation Guide.

Unit Mapping Information

This unit replaces and is equivalent to UEPOPS450A Coordinate effective workplace communication.

Links

Companion Volume implementation guides are found in VETNet - https://vetnet.gov.au/Pages/TrainingDocs.aspx?q=1715b9fa-e7bd-441c-bb8d-cf22c9c825a8

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Assessment Requirements for UEPOPS450 Coordinate workplace communication

Modification History

Release 1. This is the first release of this unit of competency in the UEP Generation Training Package.

Performance Evidence

Evidence required to demonstrate competence in this unit must be relevant to and satisfy all the requirements of the elements, performance criteria and range of conditions on at least two separate occasions and includes:

- applying Work, Health and Safety (WHS)/Occupational Health and Safety (OHS) requirements including:
  - emergency procedures
  - risk control measures
  - safe working practices
- coordinating team communications
- facilitating team meetings
- identifying team member problems with interpreting instructions and communicating with others
- managing workplace meetings
- planning and preparing for communication
- preparing meeting minutes and agendas
- representing team views after extracting information from team members
- using communication equipment
- utilising communication techniques and procedures

Knowledge Evidence

Evidence required to demonstrate competence in this unit must be relevant to and satisfy all the requirements of the elements, performance criteria and range of conditions and includes knowledge of:

- identifying team member communication problems
- plan and prepare for workplace communication including:
  - communication equipment
  - facilitation of team meetings
  - meeting agenda requisites
  - meeting and communication principles and procedures

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  - preparation of minutes
- WHS/OHS legislated requirements including:
  - emergency procedures
  - risk control measures
  - safe working practices
- workplace documentation
- workplace policies and procedures

Assessment Conditions

As a minimum, assessors must satisfy applicable regulatory requirements, which include requirements in the Standards for Registered Training Organisations current at the time of assessment.

As a minimum, assessment must satisfy applicable regulatory requirements, which include requirements in the Standards for Registered Training Organisations current at the time of assessment.

Assessment processes and techniques must be appropriate to the language, literacy and numeracy requirements of the work being performed and the needs of the candidate.

Assessment must occur in workplace operational situations. Where this is not appropriate, assessment must occur in simulated workplace operational situations that reflect workplace conditions.

Resources for assessment must include access to:

- a range of relevant exercises, case studies and/or other simulations
- relevant and appropriate materials, tools, equipment and personal protective equipment currently used in industry
- applicable documentation including workplace procedures, industry standards, equipment specifications, regulations, codes of practice and operation manuals.

Links

Companion Volume implementation guides are found in VETNet - https://vetnet.gov.au/Pages/TrainingDocs.aspx?q=1715b9fa-e7bd-441c-bb8d-cf22c9c825a8

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UEPOPS451 Coordinate the use of contingency plans

Modification History

Release 1. This is the first release of this unit of competency in the UEP Generation Training Package.

Application

This unit involves the skills and knowledge required to coordinate the use of contingency plans that are developed to support the integrity of power generation facilities.

A contingency plan is a course of action designed to help a power generation facility respond to a significant event. A contingency plan should include any event that might disrupt power generation facility operations.

Competency in this unit requires the ability to identify contingencies, identify preferred contingency plans and complete all documentation. Individuals will, in general, work as coordinator in risk management, in a power generation facility.

Power generation plant operators are typically trained and authorised to isolate, prepare plant and issue permits to work.

No licensing, legislative or certification requirements apply to this unit at the time of publication.

Note: Workplace practice

The application of the skills and knowledge described in this unit may require a licence or training permit to practice in the workplace where work is carried out on gas and electrical installations. Additional conditions may apply under state and territory legislative and regulatory licensing requirements.

Pre-requisite Unit

UEPOPS370 Facilitate the use of contingency plans

Competency Field

Operations

Unit Sector

Electricity generation

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Elements and Performance Criteria

ELEMENTS	PERFORMANCE CRITERIA
Elements describe the essential outcomes.	Performance criteria describe the performance needed to demonstrate achievement of the element.
1 Identify potential risks	**1.1** Potential contingencies are identified, in accordance with workplace procedures, legislative requirements and industry standards, from a risk analysis of functions which are critical to the performance of the power generation facility
	1.2 Likelihood and impact of risks are assessed and evaluated for impact, in accordance with workplace procedures and the risk management system
	1.3 Risks are arranged using a risk management matrix in order of priority and/or impact
2 Coordinate preferred contingency plan	**2.1** Processes for each identified risk are developed and coordinated, in accordance with the contingency plan
	2.2 Workplace procedures and risk management strategies are mapped to contingency plan processes
	2.3 Analysis of human, fiscal and resourcing requirements that may impact use of the contingency plan is undertaken
3 Complete documentation	**3.1** Contingency plan problems and status are reported, in accordance with workplace procedures
	3.2 Contingency plan documentation is updated, in accordance with workplace procedures

Foundation Skills

Foundation skills essential to performance are explicit in the performance criteria of this unit of competency.

Range of Conditions

Range is restricted to essential operating conditions and any other variables essential to the work environment.

Non-essential conditions may be found in the Companion Volume Implementation Guide.

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Unit Mapping Information

This unit replaces and is equivalent to UEPOPS451A Coordinate the use of contingency plans.

Links

Companion Volume implementation guides are found in VETNet - https://vetnet.gov.au/Pages/TrainingDocs.aspx?q=1715b9fa-e7bd-441c-bb8d-cf22c9c825a8

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Assessment Requirements for UEPOPS451 Coordinate the use of contingency plans

Modification History

Release 1. This is the first release of this unit of competency in the UEP Generation Training Package.

Performance Evidence

Evidence required to demonstrate competence in this unit must be relevant to and satisfy all the requirements of the elements, performance criteria and range of conditions on at least two separate occasions and includes:

- applying Work, Health and Safety (WHS)/Occupational Health and Safety (OHS) requirements including:
  - emergency procedures
  - risk control measures
  - safe working practices
- categorising and working with contingency plan options
- communicating with personnel
- completing documentation
- coordinating preferred contingency plan
- developing and implementing contingency plan processes and procedures
- identifying potential risks
- using risk management matrix tools

Knowledge Evidence

Evidence required to demonstrate competence in this unit must be relevant to and satisfy all the requirements of the elements, performance criteria and range of conditions and includes knowledge of:

- contingency plan processes and procedures
- contingency plans
- identification of potential risks and contingency options
- legislation, industry standards, codes of practice and regulations
- risk management matrix tools
- WHS/OHS legislated requirements including:
  - emergency procedures
  - risk control measures
  - safe working practices

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- workplace documentation
- workplace policies and procedures

Assessment Conditions

As a minimum, assessors must satisfy applicable regulatory requirements, which include requirements in the Standards for Registered Training Organisations current at the time of assessment.

As a minimum, assessment must satisfy applicable regulatory requirements, which include requirements in the Standards for Registered Training Organisations current at the time of assessment.

Assessment processes and techniques must be appropriate to the language, literacy and numeracy requirements of the work being performed and the needs of the candidate.

Assessment must occur in workplace operational situations. Where this is not appropriate, assessment must occur in simulated workplace operational situations that reflect workplace conditions.

Resources for assessment must include access to:

- a range of relevant exercises, case studies and/or other simulations
- relevant and appropriate materials, tools, equipment and personal protective equipment currently used in industry
- applicable documentation including workplace procedures, industry standards, equipment specifications, regulations, codes of practice and operation manuals.

Links

Companion Volume implementation guides are found in VETNet - https://vetnet.gov.au/Pages/TrainingDocs.aspx?q=1715b9fa-e7bd-441c-bb8d-cf22c9c825a8

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UEPOPS452 Conduct operational checks and carry out corrective action on in-service electrical plant

Modification History

Release 1. This is the first release of this unit of competency in the UEP Generation Training Package.

Application

This unit involves the skills and knowledge required to conduct operational checks and carry out corrective actions on in-service electrical plant.

An operational check is the verification that a group of components or units are working together to accomplish a single objective. An operational check consists of running in-service electrical plant to ensure that all the systems function together.

Competency in this unit requires the ability to plan for plant in-service checks, carry out in-service electrical checks, carry out corrective actions and complete work. Individuals will, in general, work as an operator in a power generation facility.

Power generation plant operators are typically trained and authorised to isolate, prepare plant and issue permits to work.

No licensing, legislative or certification requirements apply to this unit at the time of publication.

Note: Workplace practices

The application of the skills and knowledge described in this unit may require a licence or training permit to practice in the workplace where work is carried out on gas and electrical installations. Additional conditions may apply under state and territory legislative and regulatory licensing requirements.

Pre-requisite Unit

There are no prerequisite units.

Competency Field

Operations

Unit Sector

Electricity generation

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Elements and Performance Criteria

ELEMENTS	PERFORMANCE CRITERIA
Elements describe the essential outcomes.	Performance criteria describe the performance needed to demonstrate achievement of the element.
1 Plan for plant in-service checks	**1.1** Safety issues and Work, Health and Safety (WHS)/Occupational Health and Safety (OHS) regulations are identified, in accordance with workplace procedures
	1.2 Work, electrical in-service plant and resource requirements are identified from relevant personnel, work orders and documentation, in accordance with workplace procedures
	1.3 Electrical in-service plant status and work requirements are confirmed with appropriate personnel or by site inspection, in accordance with workplace procedures
	1.4 Equipment is checked for correct calibration and operation and materials are obtained and inspected for compliance with job specification, in accordance with workplace procedures
	1.5 Potential hazards are identified and risk control measures are selected, in accordance with the workplace procedures
	1.6 Pre-access checks of electrical in-service plant are carried out, in accordance with workplace procedures and site requirements
2 Carry out in-service electrical checks	**2.1** Electrical in-service plant is operated, in accordance with workplace procedures and manufacturers' recommendations
	2.2 Electrical in-service plant checks are conducted and monitored, in accordance with workplace procedures, to detect deviations from normal operation parameters
	2.3 Electrical in-service checks are performed, in accordance with workplace procedures
	2.4 Electrical in-service plant integrity and personnel safety are maintained, in accordance with workplace procedures and in consultation with appropriate personnel and technical and operational documentation

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3 Carry out corrective actions	**3.1**	Corrective actions are identified after analysing electrical in-service plant operations, in accordance with manufacturers' recommendations and workplace procedures
	3.2	Isolations are confirmed, where appropriate, in accordance with workplace procedures and site requirements
	3.3	Equipment for use in conducting operational checks is modified using appropriate plans, drawings and manuals, in accordance with workplace procedures
	3.4	Corrective actions are carried out on electrical in-service plant, without damage or loss to other plant, in accordance with workplace procedures
	3.5	Modified electrical in-service plant is set up to meet operational parameters, in accordance with workplace procedures and manufacturers specifications
	3.6	Final electrical in-service plant inspection is performed, in accordance with workplace procedures
4 Complete work	**4.1**	Operational checks and corrective actions are completed, and electrical in-service plant is returned to operational status, in accordance with workplace procedures
	4.2	Appropriate personnel are notified of work completion, in accordance with workplace procedures
	4.3	Electrical in-service plant problems and corrective actions are reported, in accordance with workplace procedures

Foundation Skills

Foundation skills essential to performance are explicit in the performance criteria of this unit of competency.

Range of Conditions

Range is restricted to essential operating conditions and any other variables essential to the work environment.

Non-essential conditions may be found in the Companion Volume Implementation Guide.

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Unit Mapping Information

This unit replaces and is equivalent to UEPOPS452A Conduct operational checks and carry out corrective action on in-service electrical plant.

Links

Companion Volume implementation guides are found in VETNet - https://vetnet.gov.au/Pages/TrainingDocs.aspx?q=1715b9fa-e7bd-441c-bb8d-cf22c9c825a8

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Assessment Requirements for UEPOPS452 Conduct operational checks and carry out corrective action on in-service electrical plant

Modification History

Release 1. This is the first release of this unit of competency in the UEP Generation Training Package.

Performance Evidence

Evidence required to demonstrate competence in this unit must be relevant to and satisfy all the requirements of the elements, performance criteria and range of conditions on at least two separate occasions and includes:

- applying Work, Health and Safety(WHS)/Occupational Health and Safety (OHS) requirements including:
  - emergency procedures
  - risk control measures
  - safe working practices
- carrying out in-service electrical checks
- communicating with personnel
- completing work
- determining and completing corrective actions using data analysis techniques and tools
- finalising documentation using recording procedures
- identifying electrical in-service plant status
- implementing legislation, industry standards, codes of practice and regulations
- interpreting power generation plant drawings, manufacturers' specifications and manuals
- maintaining electrical in-service plant integrity
- performing isolations
- planning for electrical in-service plant checks
- preparing electrical in-service plant or equipment for operational check
- recognising abnormal electrical in-service plant operating conditions
- recognising remote indication of plant status and conditions
- working with permit to work system

Knowledge Evidence

Evidence required to demonstrate competence in this unit must be relevant to and satisfy all the requirements of the elements, performance criteria and range of conditions and includes knowledge of:

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- electrical in-service plant and equipment, its location and operating parameters
- electrical in-service plant drawings
- electrical in-service plant status
- isolations
- legislation, industry standards, codes of practice and regulations
- manufacturers' specifications and manuals
- modification techniques
- permit to work system
- typical arrangements of power production plant
- WHS/OHS legislated requirements including:
  - emergency procedures
  - risk control measures
  - safe working practices
- workplace documentation
- workplace policies and procedures

Assessment Conditions

As a minimum, assessors must satisfy applicable regulatory requirements, which include requirements in the Standards for Registered Training Organisations current at the time of assessment.

As a minimum, assessment must satisfy applicable regulatory requirements, which include requirements in the Standards for Registered Training Organisations current at the time of assessment.

Assessment processes and techniques must be appropriate to the language, literacy and numeracy requirements of the work being performed and the needs of the candidate.

Assessment must occur in workplace operational situations. Where this is not appropriate, assessment must occur in simulated workplace operational situations that reflect workplace conditions.

Resources for assessment must include access to:

- a range of relevant exercises, case studies and/or other simulations
- relevant and appropriate materials, tools, equipment and personal protective equipment currently used in industry
- applicable documentation including workplace procedures, industry standards, equipment specifications, regulations, codes of practice and operation manuals.

Links

Companion Volume implementation guides are found in VETNet - https://vetnet.gov.au/Pages/TrainingDocs.aspx?q=1715b9fa-e7bd-441c-bb8d-cf22c9c825a8

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UEPOPS454 Coordinate response to critical incidents

Modification History

Release 1. This is the first release of this unit of competency in the UEP Generation Training Package.

Application

This unit involves the skills and knowledge required to respond to incidents of a critical nature that may impact on the operations of power generation plant or its' system, endanger human life or property or have an adverse impact on the environment.

A critical incident refers to an event that may result in a high level of risk, directly or indirectly to the core operations of a power generation facility. The level of risk is determined using the facility's risk management processes as outlined in the Risk Management System.

Competency in this unit requires the ability to identify critical incident and consequences, establish contingency plan, establish communications, coordinate response to a critical incident and the documentation of the incident and response. Individuals will, in general, work as an operator with responsibility for coordinating critical incident responses and/or risk management, in a power generation facility.

Power generation plant operators are typically trained and authorised to isolate, prepare plant and issue permits to work.

No licensing, legislative or certification requirements apply to this unit at the time of publication.

Note: Workplace practice

The application of the skills and knowledge described in this unit may require a licence or training permit to practice in the workplace where work is carried out on gas and electrical installations. Additional conditions may apply under state and territory legislative and regulatory licensing requirements.

Pre-requisite Unit

UEPOPS369 Respond to a critical incident

Competency Field

Operations

Unit Sector

Electricity generation

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Elements and Performance Criteria

ELEMENTS	PERFORMANCE CRITERIA
Elements describe the essential outcomes.	Performance criteria describe the performance needed to demonstrate achievement of the element.
1 Identify critical incident and consequences	**1.1** Critical incidents and probable implications are identified and evaluated, in accordance with workplace procedures
	1.2 Secondary threats are identified and monitored, in accordance with workplace procedures
	1.3 Data is evaluated, in accordance with workplace procedures to determine probable causes, consequences and potential responses
2 Establish contingency plan	**2.1** Contingency and emergency response plans are identified, in accordance with workplace procedures
	2.2 Additional resources are identified, in accordance with workplace procedures
	2.3 Alternate contingency plan strategies to cater for crisis variations are developed, in consultation with team members and in accordance with workplace procedures
3 Establish communications	**3.1** Communication links with external authorities for coordination of resources are established, in accordance with workplace procedures
	3.2 Communication with key stakeholders is established to disseminate information, in accordance with workplace procedures
	3.3 Team roles, both internal and external, are identified and conveyed to personnel, in accordance with workplace procedures
4 Coordinate response to critical incident	**4.1** Response is coordinated, in accordance with workplace procedures and site requirements, with allowance made for personnel and equipment limitations
	4.2 Events and responses are prioritised with consideration given to the needs of stakeholders, in accordance with workplace procedures
	4.3 Impact of secondary threats are identified and assessed,

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		in accordance with workplace procedures
	4.4	Contingency plan is actioned, in accordance with workplace policies and procedures
	4.5	Additional resources are coordinated and directed, in accordance with workplace procedures
	4.6	Critical incident power generation restoration strategies are monitored, evaluated and adjusted, in accordance with workplace procedures
5 Document incident and response	**5.1**	Critical incident equipment failure or problems are recorded and processed, in accordance with workplace procedures
	5.2	Feedback from stakeholders and personnel debriefing comments are recorded and analysed, in accordance with workplace procedures
	5.3	Critical incident reports and findings are generated and distributed to appropriate personnel, in accordance with workplace procedures
	5.4	Improvements to critical incident procedures are recommended to appropriate personnel, in accordance with workplace procedures
	5.5	Alternative contingency strategies are identified, analysed and recommendations are communicated to appropriate personnel, in accordance with workplace procedures

Foundation Skills

Foundation skills essential to performance are explicit in the performance criteria of this unit of competency.

Range of Conditions

Range is restricted to essential operating conditions and any other variables essential to the work environment.

Non-essential conditions may be found in the Companion Volume Implementation Guide.

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Unit Mapping Information

This unit replaces and is equivalent to UEPOPS454A Coordinate response to critical incidents.

Links

Companion Volume implementation guides are found in VETNet - https://vetnet.gov.au/Pages/TrainingDocs.aspx?q=1715b9fa-e7bd-441c-bb8d-cf22c9c825a8

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Assessment Requirements for UEPOPS454 Coordinate response to critical incidents

Modification History

Release 1. This is the first release of this unit of competency in the UEP Generation Training Package.

Performance Evidence

Evidence required to demonstrate competence in this unit must be relevant to and satisfy all the requirements of the elements, performance criteria and range of conditions on at least two separate occasions and includes:

- applying Work, Health and Safety (WHS)/Occupational Health and Safety (OHS) requirements including:
  - emergency procedures
  - risk control measures
  - safe working practices
- communicating with external and internal stakeholders
- conducting debriefings and reviewing stakeholder feedback
- coordinating critical incident situations
- coordinating personnel
- determining communications
- documenting critical incident and response using recording procedures
- establishing contingency and emergency response plans
- identifying critical incidents and consequences
- implementing legislation, industry standards, codes of practice and regulations
- organising and coordinating response to critical incidents
- using policies and procedures for critical incidents
- utilising data analysis techniques and tools when assessing critical incident risks and responses
- working with contingency plans

Knowledge Evidence

Evidence required to demonstrate competence in this unit must be relevant to and satisfy all the requirements of the elements, performance criteria and range of conditions and includes knowledge of:

- communication during critical incidents
- contingency and emergency response plans
- coordination of critical incident situations

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- data analysis techniques and tools
- debriefings and stakeholder feedback methods
- legislation, industry standards, codes of practice and regulations
- role of external authorities
- WHS/OHS legislated requirements including:
  - emergency procedures
  - risk control measures
  - safe working practices
- workplace documentation
- workplace policies and procedures

Assessment Conditions

As a minimum, assessors must satisfy applicable regulatory requirements, which include requirements in the Standards for Registered Training Organisations current at the time of assessment.

As a minimum, assessment must satisfy applicable regulatory requirements, which include requirements in the Standards for Registered Training Organisations current at the time of assessment.

Assessment processes and techniques must be appropriate to the language, literacy and numeracy requirements of the work being performed and the needs of the candidate.

Assessment must occur in workplace operational situations. Where this is not appropriate, assessment must occur in simulated workplace operational situations that reflect workplace conditions.

Resources for assessment must include access to:

- a range of relevant exercises, case studies and/or other simulations
- relevant and appropriate materials, tools, equipment and personal protective equipment currently used in industry
- applicable documentation including workplace procedures, industry standards, equipment specifications, regulations, codes of practice and operation manuals.

Links

Companion Volume implementation guides are found in VETNet - https://vetnet.gov.au/Pages/TrainingDocs.aspx?q=1715b9fa-e7bd-441c-bb8d-cf22c9c825a8

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UEPOPS456 Perform switching to a switching program

Modification History

Release 1. This is the first release of this unit of competency in the UEP Generation Training Package.

Application

This unit involves the skills and knowledge required to perform switching to a switching program.

An electrical switch can alternate a load between two sources either manually or automatically when sensors detect one of the sources has lost or gained power. A switch is installed where the backup generator is located so that the generator can be used to provide temporary electrical power, as required.

Competency in this unit requires the ability to prepare for switching program, carry out switching program, and complete all documentation. Individuals will, in general, work as an operator in, in a power generation facility.

Power generation plant operators are typically trained and authorised to isolate, prepare plant and issue permits to work.

No licensing, legislative or certification requirements apply to this unit at the time of publication.

Note: Workplace practice

The application of the skills and knowledge described in this unit may require a licence or training permit to practice in the workplace where work is carried out on gas and electrical installations. Additional conditions may apply under state and territory legislative and regulatory licensing requirements.

Pre-requisite Unit

There are no prerequisite units.

Competency Field

Operations

Unit Sector

Electricity generation

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Elements and Performance Criteria

ELEMENTS	PERFORMANCE CRITERIA
Elements describe the essential outcomes.	Performance criteria describe the performance needed to demonstrate achievement of the element.
1 Prepare for switching program	**1.1** Authorisation is confirmed to perform switching operation with coordinating personnel, in accordance with workplace procedures
	1.2 Work, Health and Safety (WHS)/Occupational Health and Safety (OHS) regulations, legislative requirements, industry standards, codes of practice and environmental obligations are identified, applied and monitored
	1.3 Contingency plan is discussed with personnel coordinating switching program, in accordance with workplace procedures
	1.4 Permits and access requirements are identified prior to program commencement, in accordance with workplace procedures
	1.5 Documentation is received and checked prior to starting switching program, in accordance with workplace procedures
2 Carry out switching program	**2.1** Personnel involved in switching program is confirmed and they are directed to switching locations, in accordance with workplace procedures
	2.2 Communication is established and maintained with personnel coordinating switching program, in accordance with workplace procedures
	2.3 Access to electrical power generation plant is obtained, in accordance with workplace procedures
	2.4 Switching program steps are verified before and after each operation, in accordance with workplace procedures
	2.5 Switching steps are documented upon completion of each operation, in accordance with workplace procedures
	2.6 Permits are issued, monitored and recorded, in accordance with workplace procedures

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	2.7	Switching program is completed and is recorded, in accordance with workplace procedures
3 Complete documentation	**3.1**	Equipment problems, abnormalities and status are reported, in accordance with workplace
	3.2	Documentation is updated, in accordance with workplace procedures

Foundation Skills

Foundation skills essential to performance are explicit in the performance criteria of this unit of competency.

Range of Conditions

Range is restricted to essential operating conditions and any other variables essential to the work environment.

Non-essential conditions may be found in the Companion Volume Implementation Guide.

Unit Mapping Information

This unit replaces and is equivalent to UEPOPS456A Perform switching to a switching program.

Links

Companion Volume implementation guides are found in VETNet - https://vetnet.gov.au/Pages/TrainingDocs.aspx?q=1715b9fa-e7bd-441c-bb8d-cf22c9c825a8

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Assessment Requirements for UEPOPS456 Perform switching to a switching program

Modification History

Release 1. This is the first release of this unit of competency in the UEP Generation Training Package.

Performance Evidence

Evidence required to demonstrate competence in this unit must be relevant to and satisfy all the requirements of the elements, performance criteria and range of conditions on at least two separate occasions and includes:

- acquiring and analysing system operation information
- applying Work, Health and Safety (WHS)/Occupational Health and Safety (OHS) regulations including:
  - emergency procedures
  - risk control measures
  - safe working practices
- carrying out switching program
- communicating with personnel
- completing documentation using recording procedures
- directing and coordinating switching programs
- implementing legislations, industry standards, codes of practice and regulations
- preparing, planning and prioritising work for switching programs
- using permit to work system
- working with switching operations and procedures

Knowledge Evidence

Evidence required to demonstrate competence in this unit must be relevant to and satisfy all the requirements of the elements, performance criteria and range of conditions and includes knowledge of:

- implementation of switching programs
- legislation, industry standards, codes of practice and regulations
- manufacturers' specifications and manuals
- permit to work system
- power generation plant and equipment, its location and operating parameters
- switching operations and procedures
- typical arrangements of power generation plant

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- WHS/OHS legislated requirements including:
  - emergency procedures
  - risk control measures
  - safe working practices
- workplace policies and procedures
- workplace documentation

Assessment Conditions

As a minimum, assessors must satisfy applicable regulatory requirements, which include requirements in the Standards for Registered Training Organisations current at the time of assessment.

As a minimum, assessment must satisfy applicable regulatory requirements, which include requirements in the Standards for Registered Training Organisations current at the time of assessment.

Assessment processes and techniques must be appropriate to the language, literacy and numeracy requirements of the work being performed and the needs of the candidate.

Assessment must occur in workplace operational situations. Where this is not appropriate, assessment must occur in simulated workplace operational situations that reflect workplace conditions.

Resources for assessment must include access to:

- a range of relevant exercises, case studies and/or other simulations
- relevant and appropriate materials, tools, equipment and personal protective equipment currently used in industry
- applicable documentation including workplace procedures, industry standards, equipment specifications, regulations, codes of practice and operation manuals.

Links

Companion Volume implementation guides are found in VETNet - https://vetnet.gov.au/Pages/TrainingDocs.aspx?q=1715b9fa-e7bd-441c-bb8d-cf22c9c825a8

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UEPOPS457 Control electrical energy production

Modification History

Release 1. This is the first release of this unit of competency in the UEP Generation Training Package.

Application

This unit involves the skills and knowledge required to control the safe operation of energy production to meet demand on an electricity generating unit.

Generating units usually operate independently, with most power generation production facilities consisting of several independent generating units which can be brought online or taken offline as demand fluctuates.

Competency in this unit requires the ability to plan for power generating plant operation, operate generator and excitation system, control generation of electrical energy and the completion of work. Individuals will, in general, work as an operator, in a power generation facility.

Power generation plant operators are typically trained and authorised to isolate, prepare plant and issue permits to work.

No licensing, legislative or certification requirements apply to this unit at the time of publication.

Note: Workplace practice

The application of the skills and knowledge described in this unit may require a licence or training permit to practice in the workplace where work is carried out on gas and electrical installations. Additional conditions may apply under state and territory legislative and regulatory licensing requirements.

Pre-requisite Unit

There are no prerequisite units.

Competency Field

Operations

Unit Sector

Electricity generation

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Elements and Performance Criteria

ELEMENTS	PERFORMANCE CRITERIA
Elements describe the essential outcomes.	Performance criteria describe the performance needed to demonstrate achievement of the element.
1 Plan for plant operation	**1.1** Safety issues related to controlling electrical energy production are identified, in accordance with Work, Health and Safety (WHS)/Occupational Health and Safety (OHS) regulations, legislative requirements, industry standards and workplace procedures
	1.2 Work, electrical energy production plant and resourcing are identified, in accordance with workplace procedures, from relevant information and documentation
	1.3 Preoperational check on electrical energy production plant is carried out, in accordance with workplace procedures and site requirements
2 Operate generator and excitation system	**2.1** Generator and excitation system is operated, in accordance with workplace procedures and manufacturers' operating recommendations
	2.2 Synchronising requirements are assessed, evaluated and achieved, in accordance with workplace procedures, to ensure generator and excitation system stability
	2.3 Generator and excitation system is monitored and observed, in accordance with workplace procedures, to detect deviations from normal operating conditions
	2.4 Corrective actions are taken to rectify generator and excitation system abnormalities, in accordance with workplace procedures and manufacturers' recommendations
3 Control generation of electrical energy	**3.1** Generator output is adjusted to meet demand, in accordance with workplace procedures
	3.2 Reactive power generation and voltage regulation requirements are assessed, in accordance with workplace procedures, and the generator and excitation system is controlled to achieve desired output
	3.3 Generator stabilities and operating limits are assessed and the generator and excitation system is controlled to maintain those limits, in accordance with workplace

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		procedures and manufacturers' recommendations
	3.4	Generator cooling systems and limits are monitored and assessed and the generator and excitation system is controlled to maintain those limits, in accordance with workplace procedures and manufacturers' recommendations
4 Complete documentation	**4.1**	Power generating plant problems, movements and status is reported, in accordance with workplace procedures
	4.2	Documentation is updated, in accordance with workplace procedures

Foundation Skills

Foundation skills essential to performance are explicit in the performance criteria of this unit of competency.

Range of Conditions

Range is restricted to essential operating conditions and any other variables essential to the work environment.

Non-essential conditions may be found in the Companion Volume Implementation Guide.

Unit Mapping Information

This unit replaces and is equivalent to UEPOPS457A Control electrical energy production.

Links

Companion Volume implementation guides are found in VETNet - https://vetnet.gov.au/Pages/TrainingDocs.aspx?q=1715b9fa-e7bd-441c-bb8d-cf22c9c825a8

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Assessment Requirements for UEPOPS457 Control electrical energy production

Modification History

Release 1. This is the first release of this unit of competency in the UEP Generation Training Package.

Performance Evidence

Evidence required to demonstrate competence in this unit must be relevant to and satisfy all the requirements of the elements, performance criteria and range of conditions on at least two separate occasions and includes:

- analysing electrical energy production plant faults using diagnostic and testing techniques
- applying Work, Health and Safety (WHS)/Occupational Health and Safety (OHS) requirements including:
  - emergency procedures
  - risk control measures
  - safe working practices
- completing documentation
- controlling generation of electrical energy production
- directing the operation of interacting systems, electrical energy production plant and equipment
- identifying electrical energy production plant status
- implementing legislation, industry standards, codes of practice and regulations
- interpreting manufacturers' specifications and manuals
- maintaining generator unit integrity
- monitoring electrical energy production unit operations
- operating generator and excitation system
- organising resources
- planning for electrical energy production plant operation
- reviewing electrical energy production plant operation using data analysis techniques and tools
- undertaking corrective actions

Knowledge Evidence

Evidence required to demonstrate competence in this unit must be relevant to and satisfy all the requirements of the elements, performance criteria and range of conditions and includes knowledge of:

- analysis of electrical energy production plant faults

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- control of electrical energy generation production
- electrical energy production plant and equipment, its location and operating parameters
- electrical energy production plant operation monitoring
- electrical energy production unit operations
- generator and system stability including system components and interactions
- generator excitation and cooling system types and characteristics
- legislation, industry standards, codes of practice and regulations
- manufacturers' specifications and manuals
- operation of generator and excitation systems
- typical arrangements of power generating production plant
- WHS/OHS legislated requirements including:
  - emergency procedures
  - risk control measures
  - safe working practices
- workplace documentation
- workplace policies and procedures

Assessment Conditions

As a minimum, assessors must satisfy applicable regulatory requirements, which include requirements in the Standards for Registered Training Organisations current at the time of assessment.

As a minimum, assessment must satisfy applicable regulatory requirements, which include requirements in the Standards for Registered Training Organisations current at the time of assessment.

Assessment processes and techniques must be appropriate to the language, literacy and numeracy requirements of the work being performed and the needs of the candidate.

Assessment must occur in workplace operational situations. Where this is not appropriate, assessment must occur in simulated workplace operational situations that reflect workplace conditions.

Resources for assessment must include access to:

- a range of relevant exercises, case studies and/or other simulations
- relevant and appropriate materials, tools, equipment and personal protective equipment currently used in industry
- applicable documentation including workplace procedures, industry standards, equipment specifications, regulations, codes of practice and operation manuals.

Links

Companion Volume implementation guides are found in VETNet - https://vetnet.gov.au/Pages/TrainingDocs.aspx?q=1715b9fa-e7bd-441c-bb8d-cf22c9c825a8

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UEPOPS501 Manage Work, Health and Safety policy and procedures

Modification History

Release 1. This is the first release of this unit of competency in the UEP Generation Training Package.

Application

This unit involves the skills and knowledge required to manage the identification of hazards and the assessment and control of risks associated with generating plant and equipment.

Work, Health and Safety (WHS)/Occupational Health and Safety (OHS) is concerned with protecting the wellbeing of all workplace stakeholders from exposure to hazards and risks resulting from activities in power generation facilities. It involves the assessment and mitigation of risks that can cause short and long term harm.

Competency in this unit requires the ability to identify hazards, analyse and manage WHS/OHS risks, implement and manage procedures for identifying risks, recommend controls for hazards, identify and manage licensing and certification issues and review and evaluate risk control measures. Individuals will, in general, work as operators with responsibility for WHS/OHS, in a power generation facility.

No licensing, legislative or certification requirements apply to this unit at the time of publication.

Note: Workplace practice

The application of the skills and knowledge described in this unit may require a licence or training permit to practice in the workplace where work is carried out on gas and electrical installations. Additional conditions may apply under state and territory legislative and regulatory licensing requirements.

Pre-requisite Unit

UEENEEE117A Implement and monitor energy sector /WHS policies and procedures

Competency Field

Operations

Unit Sector

Electricity generation

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Elements and Performance Criteria

ELEMENTS	PERFORMANCE CRITERIA
Elements describe the essential outcomes.	Performance criteria describe the performance needed to demonstrate achievement of the element.
1 Identify hazards	**1.1** Recognised sources of information, data and advice on power generating plant and equipment hazards are accessed, in accordance with workplace procedures and Work, Health and Safety (WHS)/Occupational Health and Safety (OHS) regulations
	1.2 Hazardous situations associated with use of generating plant and equipment are identified, analysed and managed, in accordance with workplace procedures
	1.3 Key stakeholders are identified and consulted, in accordance with workplace procedures
	1.4 WHS/OHS recording and reporting procedures on hazards and risks are reviewed and managed
2 Analyse and manage WHS/OHS risks	**2.1** Risk assessment controls are determined, analysed and managed in consultation with key stakeholders
	2.2 Register of risk control measures including permits, is developed and managed, in accordance with workplace procedures
3 Implement and manage procedures for identifying hazards	**3.1** Hierarchy of control measures are implemented and managed, in accordance with workplace procedures
	3.2 Workplace monitoring processes are continually managed to eliminate or control risks, in accordance with workplace procedures
	3.3 Risks requiring further controls are identified and managed, in accordance with workplace procedures
	3.4 Management of reporting cycle to key stakeholders is undertaken, in accordance with workplace procedures
4 Recommend controls for hazards	**4.1** Permits to work and access procedures are monitored and managed, in liaison with key stakeholders, in accordance with workplace procedures
	4.2 Isolation procedures are implemented and managed, in accordance with workplace procedures, to ensure

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		continued safety of all workplace personnel
	4.3	Maintenance procedures are documented and communicated to all personnel to ensure generating plant and equipment are safe, in accordance with workplace procedures
	4.4	Modifications to generating plant or equipment are recorded in return to service documentation.
	4.5	Work practices are monitored and modified, as required, for safe operation of generating plant and equipment, in accordance with workplace procedures
	4.6	Maintenance systems are monitored and evaluated for safe operation of generating plant and equipment
5 Identify and manage licensing and certification issues	**5.1**	WHS/OHS legislative requirements for plant registration, operator licensing or authorisation are identified and communicated to key stakeholders
	5.2	Training to meet WHS/OHS regulatory requirements is identified and communicated to key stakeholders
	5.3	WHS/OHS compliance for operator licensing, registration or authorisation is managed, in accordance with workplace procedures
	5.4	Records of operator competencies in working with generating plant and equipment are managed, in accordance with workplace procedures
6 Review and evaluate risk control measures	**6.1**	Risk control measures are reviewed and evaluated, in accordance with workplace procedures, and risk assessments are conducted
	6.2	Risk control plans are developed in consultation with key stakeholders, and are managed, in accordance with workplace procedures
	6.3	Record system is managed for generating plant, equipment and systems of work, in accordance with workplace procedures
	6.4	WHS/OHS improvements are implemented and managed, in consultation with key stakeholders
	6.5	WHS/OHS management system is evaluated, reviewed and reported on, in accordance with workplace

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procedures to ensure generating plant safety

Foundation Skills

Foundation skills essential to performance are explicit in the performance criteria of this unit of competency.

Range of Conditions

Range is restricted to essential operating conditions and any other variables essential to the work environment.

Non-essential conditions may be found in the Companion Volume Implementation Guide.

Unit Mapping Information

This unit replaces and is equivalent to UEPOPS501B Manage Occupational Health and Safety policy and procedures.

Links

Companion Volume implementation guides are found in VETNet - https://vetnet.gov.au/Pages/TrainingDocs.aspx?q=1715b9fa-e7bd-441c-bb8d-cf22c9c825a8

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Assessment Requirements for UEPOPS501 Manage Work, Health and Safety policy and procedures

Modification History

Release 1. This is the first release of this unit of competency in the UEP Generation Training Package.

Performance Evidence

Evidence required to demonstrate competence in this unit must be relevant to and satisfy all the requirements of the elements, performance criteria and range of conditions on at least two separate occasions and includes:

- analysing WHS/OHS risks associated with generating plant
- applying Work, Health and Safety (WHS)/Occupational Health and Safety (OHS) requirements including:
  - emergency procedures
  - risk control measures
  - safe working practices
- communicating with key stakeholders
- identifying hazards
- implementing hierarchy of control
- implementing legislation, industry standards, codes of practice and regulations
- locating and identifying generating plant and equipment
- managing and supervising staff
- managing controls for hazards associated with maintenance activities
- managing procedures for identifying hazards including
- recognising generating plant status
- recording procedures
- reviewing and implementing WHS/OHS procedures
- using hazard identification and risk control techniques

Knowledge Evidence

Evidence required to demonstrate competence in this unit must be relevant to and satisfy all the requirements of the elements, performance criteria and range of conditions and includes knowledge of:

- generating plant status
- hazard identification and risk control techniques
- hierarchy of control

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- legislation, industry standards, codes of practice and regulations
- licensing and certification requirements including isolations, access and permits
- management of WHS/OHS records
- manufacturers' specifications and manuals
- provision of WHS/OHS training including competency identification
- stakeholder management techniques
- typical arrangements of power production plant
- WHS/OHS legislated requirements including:
  - emergency procedures
  - risk control measures
  - safe working practices
- workplace documentation
- workplace policies and procedures

Assessment Conditions

As a minimum, assessors must satisfy applicable regulatory requirements, which include requirements in the Standards for Registered Training Organisations current at the time of assessment.

As a minimum, assessment must satisfy applicable regulatory requirements, which include requirements in the Standards for Registered Training Organisations current at the time of assessment.

Assessment processes and techniques must be appropriate to the language, literacy and numeracy requirements of the work being performed and the needs of the candidate.

Assessment must occur in workplace operational situations. Where this is not appropriate, assessment must occur in simulated workplace operational situations that reflect workplace conditions.

Resources for assessment must include access to:

- a range of relevant exercises, case studies and/or other simulations
- relevant and appropriate materials, tools, equipment and personal protective equipment currently used in industry
- applicable documentation including workplace procedures, industry standards, equipment specifications, regulations, codes of practice and operation manuals.

Links

Companion Volume implementation guides are found in VETNet - https://vetnet.gov.au/Pages/TrainingDocs.aspx?q=1715b9fa-e7bd-441c-bb8d-cf22c9c825a8

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UEPOPS502 Manage permit to work system

Modification History

Release 1. This is the first release of this unit of competency in the UEP Generation Training Package.

Application

This unit involves the skills and knowledge required to manage the development, implementation and review of the permit to work system in a power generation facility.

Permits to work are a formal system used to control high risk activities in power generation facilities, they specify the control measures to be used. They ensure that all hazards and precautions have been considered before any hazardous work begins.

Competency in this unit requires the ability to plan for implementation of permit to work procedures, develop permit to work system and procedures, manage permit to work system and audit permit to work procedures. Individuals will, in general, work as an operator with responsibility for managing the permit to work system in a power generation facility.

Power generation plant operators are typically trained and authorised to isolate, prepare plant and issue permits to work.

No licensing, legislative or certification requirements apply to this unit at the time of publication.

Note: Workplace practice

The application of the skills and knowledge described in this unit may require a licence or training permit to practice in the workplace where work is carried out on gas and electrical installations. Additional conditions may apply under state and territory legislative and regulatory licensing requirements.

Pre-requisite Unit

UEPOPS403 Coordinate permit to work system

UEPOPS402 Conduct multiple energy source isolation procedures for permit to work

Competency Field

Operations

Unit Sector

Electricity generation

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Elements and Performance Criteria

ELEMENTS	PERFORMANCE CRITERIA
Elements describe the essential outcomes.	Performance criteria describe the performance needed to demonstrate achievement of the element.
1 Plan for implementation of permit to work system	**1.1** Statistical records are consulted on permit to work implementation, in accordance with workplace procedures
	1.2 Requirements for the development of permit to work procedures are identified and confirmed, in accordance with workplace procedures and legislation
	1.3 Key stakeholders or equipment affected by the permit to work system are identified, in accordance with workplace procedures
	1.4 Consultation with key stakeholders to determine contingency plan implementation and timetable of review is carried out, in accordance with workplace policies and procedures
2 Develop permit to work system and procedures	**2.1** Permit to work procedures are planned and developed in accordance with workplace procedures and Work, Health and Safety (WHS)/Occupational Health and Safety (OHS) legislation requirements
	2.2 Resources are obtained and utilised for development of permit to work system, in accordance with workplace procedures
	2.3 Permit to work procedures are documented and approved, in accordance with workplace procedures
3 Implement permit to work system	**3.1** Permit to work system incidents are identified, managed and recorded, in accordance with workplace procedures and legislation requirements
	3.2 Permit to work incidents are investigated and assessed, in accordance with workplace procedures and legislation requirements
	3.3 Results and recommendations of incident investigations are documented and confirmed with appropriate personnel, in accordance with workplace procedures and legislation requirements

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4 Audit permit to work procedures	**4.1** Permit to work system is audited and results are evaluated and managed, in accordance with workplace procedures
	4.2 Audit results are documented and reports including recommendations are confirmed with appropriate personnel, in accordance with workplace procedures and legislation requirements

Foundation Skills

Foundation skills essential to performance are explicit in the performance criteria of this unit of competency.

Range of Conditions

Range is restricted to essential operating conditions and any other variables essential to the work environment.

Non-essential conditions may be found in the Companion Volume Implementation Guide.

Unit Mapping Information

This unit replaces and is equivalent to UEPOPS502B Manage permit to work system.

Links

Companion Volume implementation guides are found in VETNet - https://vetnet.gov.au/Pages/TrainingDocs.aspx?q=1715b9fa-e7bd-441c-bb8d-cf22c9c825a8

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Assessment Requirements for UEPOPS502 Manage permit to work system

Modification History

Release 1. This is the first release of this unit of competency in the UEP Generation Training Package.

Performance Evidence

Evidence required to demonstrate competence in this unit must be relevant to and satisfy all the requirements of the elements, performance criteria and range of conditions on at least two separate occasions and includes:

- applying Work, Health and Safety (WHS)/Occupational Health and Safety (OHS) requirements including:
  - emergency procedures
  - hazard identification
  - risk control measures
  - safe working practices and procedures
- conducting and managing audits and reviews of incident reports
- consulting with key stakeholders
- developing and managing permit to work system and procedures
- managing legislation, industry standards, codes of practice and regulations
- planning for implementation of permit to work system
- using data analysis techniques and tools to analyse permit to work system

Knowledge Evidence

Evidence required to demonstrate competence in this unit must be relevant to and satisfy all the requirements of the elements, performance criteria and range of conditions and includes knowledge of:

- auditing procedures and techniques
- incident investigation using evaluation techniques
- legislation, industry standards, codes of practice and regulations
- permit to work systems
- stakeholder management techniques
- WHS/OHS legislated requirements including:
  - emergency procedures
  - hazard identification
  - risk control measures

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- safe working practices and procedures
- workplace documentation
- workplace policies and procedures

Assessment Conditions

As a minimum, assessors must satisfy applicable regulatory requirements, which include requirements in the Standards for Registered Training Organisations current at the time of assessment.

As a minimum, assessment must satisfy applicable regulatory requirements, which include requirements in the Standards for Registered Training Organisations current at the time of assessment.

Assessment processes and techniques must be appropriate to the language, literacy and numeracy requirements of the work being performed and the needs of the candidate.

Assessment must occur in workplace operational situations. Where this is not appropriate, assessment must occur in simulated workplace operational situations that reflect workplace conditions.

Resources for assessment must include access to:

- a range of relevant exercises, case studies and/or other simulations
- relevant and appropriate materials, tools, equipment and personal protective equipment currently used in industry
- applicable documentation including workplace procedures, industry standards, equipment specifications, regulations, codes of practice and operation manuals.

Links

Companion Volume implementation guides are found in VETNet - https://vetnet.gov.au/Pages/TrainingDocs.aspx?q=1715b9fa-e7bd-441c-bb8d-cf22c9c825a8

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UEPOPS505 Produce maintenance strategies for generation production plant

Modification History

Release 1. This is the first release of this unit of competency in the UEP Generation Training Package.

Application

This unit involves the skills and knowledge required to undertake the establishment and implementation of maintenance strategies for power generation production plant. Generation production plant can include boilers, turbines, hydro equipment, electrical systems, control and monitoring systems, ash and dust systems, water treatment plant and fuel equipment.

A maintenance plan details the inspection, servicing, repairing or replacing of physical components of machines, plant and equipment used in power generation facilities through the implementation of a prescribed maintenance schedule. Strategies relate to what must happen to achieve the objectives outlined in the maintenance plan.

Competency in this unit requires the ability to research and plan for maintenance, establish strategies and implement strategies. Individuals will, in general, work under supervision, in a power generation facility as an operator with responsibility for maintenance planning and strategies.

Power generation plant operators are typically trained and authorised to isolate, prepare plant and issue permits to work.

No licensing, legislative or certification requirements apply to this unit at the time of publication.

Note: Workplace practice

The application of the skills and knowledge described in this unit may require a licence or training permit to practice in the workplace where work is carried out on gas and electrical installations. Additional conditions may apply under state and territory legislative and regulatory licensing requirements.

Pre-requisite Unit

UEPOPS425 Produce maintenance plans for generation production plant.

Competency Field

Operations

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Unit Sector

Electricity generation

Elements and Performance Criteria

ELEMENTS	PERFORMANCE CRITERIA
Elements describe the essential outcomes.	Performance criteria describe the performance needed to demonstrate achievement of the element.
1 Research and plan for strategies	**1.1** Existing maintenance strategies are reviewed, in accordance with workplace procedures and the maintenance plan
	1.2 Work, Health and Safety (WHS)/Occupational Health and Safety (OHS) regulations, legislative requirements, industry standards, codes of practice, manufacturers' specifications, environmental obligations and workplace procedures are identified and applied
	1.3 Business plans are reviewed, in accordance with workplace procedures, for impact on the maintenance plan and proposed work
	1.4 Major maintenance activities are identified, in accordance with workplace procedures and the maintenance plan
	1.5 Time frames for implementation and completion of maintenance strategies are established, in accordance with workplace procedures and the maintenance plan
	1.6 Key indicators of maintenance strategy performance are defined, in accordance with workplace procedures and the maintenance plan
	1.7 Budget is developed to identify maintenance costs, in accordance with workplace procedures
	1.8 Legal implications of maintenance work to be undertaken are identified, in accordance with workplace procedures
	1.9 Risk control measures are applied, in accordance with workplace procedures and maintenance plan
2 Establish strategies	**2.1** Resources to implement maintenance strategies are identified and obtained, in accordance with workplace

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		procedures
	2.2	Time frames and potential variances for maintenance scheduling are identified, in accordance with workplace procedures and maintenance plan
	2.3	Any interdependence of maintenance activities is identified and documented, in accordance with workplace procedures and maintenance plan
	2.4	Objectives for maintenance strategies are documented, in accordance with workplace procedures and maintenance plan
3 Implement strategies	**3.1**	Maintenance strategies are implemented, in accordance with workplace procedures, to facilitate outcomes
	3.2	Variances in maintenance strategies are identified, in accordance with workplace procedures
	3.3	Strategies are redeveloped or updated, in accordance with workplace procedures to satisfy outcomes
	3.4	Opportunities for maintenance strategy enhancements are identified and documented, in accordance with workplace procedures, for inclusion in future strategy preparation

Foundation Skills

Foundation skills essential to performance are explicit in the performance criteria of this unit of competency.

Range of Conditions

Range is restricted to essential operating conditions and any other variables essential to the work environment.

Non-essential conditions may be found in the Companion Volume Implementation Guide.

Unit Mapping Information

This unit replaces and is equivalent to UEPOPS505B Produce maintenance strategies for generation production plant.

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Assessment Requirements for UEPOPS505 Produce maintenance strategies for generation production plant

Modification History

Release 1. This is the first release of this unit of competency in the UEP Generation Training Package.

Performance Evidence

Evidence required to demonstrate competence in this unit must be relevant to and satisfy all the requirements of the elements, performance criteria and range of conditions on at least two separate occasions and includes:

- applying Work, Health and Safety (WHS)/Occupational Health and Safety (OHS) requirements including:
  - emergency procedures
  - risk control measures
  - safe working practices
- establishing and implementing maintenance strategies
- implementing legislation, industry standards, codes of practice and regulations
- produce maintenance strategies
- researching and planning maintenance strategies using data analysis techniques and tools
- undertaking maintenance strategy development
- using manufacturers' specifications and manuals

Knowledge Evidence

Evidence required to demonstrate competence in this unit must be relevant to and satisfy all the requirements of the elements, performance criteria and range of conditions and includes knowledge of:

- legislation, industry standards, codes of practice and regulations
- maintenance work practices and planning principles
- manufacturers' specifications and manuals
- power generation plant and equipment, its location and operating parameters
- risk management techniques
- strategy development
- techniques for maintenance strategy development
- typical arrangements of power production plant
- WHS/OHS legislated requirements including:
  - emergency procedures

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  - risk control measures
  - safe working practices
- workplace documentation
- workplace policies and procedures

Assessment Conditions

As a minimum, assessors must satisfy applicable regulatory requirements, which include requirements in the Standards for Registered Training Organisations current at the time of assessment.

As a minimum, assessment must satisfy applicable regulatory requirements, which include requirements in the Standards for Registered Training Organisations current at the time of assessment.

Assessment processes and techniques must be appropriate to the language, literacy and numeracy requirements of the work being performed and the needs of the candidate.

Assessment must occur in workplace operational situations. Where this is not appropriate, assessment must occur in simulated workplace operational situations that reflect workplace conditions.

Resources for assessment must include access to:

- a range of relevant exercises, case studies and/or other simulations
- relevant and appropriate materials, tools, equipment and personal protective equipment currently used in industry
- applicable documentation including workplace procedures, industry standards, equipment specifications, regulations, codes of practice and operation manuals.

Links

Companion Volume implementation guides are found in VETNet - https://vetnet.gov.au/Pages/TrainingDocs.aspx?q=1715b9fa-e7bd-441c-bb8d-cf22c9c825a8

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UEPOPS507 Conduct project management

Modification History

Release 1. This is the first release of this unit of competency in the UEP Generation Training Package.

Application

This unit involves the skills and knowledge required to undertake project management plans and conduct project work.

Project management is the application of processes, methods, knowledge, skills and experience to achieving explicitly stated objectives. Project management includes initiating, planning, executing, controlling and closing projects in line with budget and time frame constraints.

Competency in this unit requires the ability to plan and prepare, coordinate project plans and complete all documentation. Individuals will, in general, work as an operator with responsibility for project management, in a power generation facility.

No licensing, legislative or certification requirements apply to this unit at the time of publication.

Note: Workplace practice

The application of the skills and knowledge described in this unit may require a licence or training permit to practice in the workplace where work is carried out on gas and electrical installations. Additional conditions may apply under state and territory legislative and regulatory licensing requirements.

Pre-requisite Unit

There are no prerequisite units.

Competency Field

Operations

Unit Sector

Electricity generation

Elements and Performance Criteria

ELEMENTS	PERFORMANCE CRITERIA

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Elements describe the essential outcomes.	Performance criteria describe the performance needed to demonstrate achievement of the element.
1 Plan and prepare	**1.1** Project management scope, desired outcomes, budget and timeline dates are identified, in accordance with workplace procedures
	1.2 Resources and stakeholders are identified, availability assessed and tasks allocated, in accordance with workplace procedures and project requirements
	1.3 Preparation of technical specifications is conducted, in accordance with workplace procedures to meet project timeline dates
	1.4 Agreements with service providers and stakeholders are established, in accordance with workplace procedures and project requirements
	1.5 An integrated overview plan is prepared and distributed for review by stakeholders, in accordance with workplace procedures and project requirements
	1.6 Areas for potential overrun and resource complications are identified and are assessed for risks, in accordance with workplace procedures and project requirements
	1.7 Documentation, materials and equipment required for the project are obtained, in accordance with workplace procedures and project requirements
	1.8 Communication processes, including meetings, are organised to meet the needs of project stakeholders and service providers, in accordance with workplace procedures and project requirements
2 Coordinate project plan	**2.1** Project plan including power generation plant isolation and access requirements are coordinated, in accordance with legislative obligations, industry standards and workplace procedures
	2.2 Specialist equipment and personnel are coordinated, in accordance with workplace procedures and project requirements, to achieve desired project outcomes
	2.3 Project progress and costs are reviewed against budget targets and baseline key performance indicators
	2.4 Deviations from project management plan are identified

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		and actions are taken, in accordance with workplace procedures and project requirements to adjust project outcomes
	2.5	Deviations from project management plan requirements are reported to relevant stakeholders, in accordance with workplace procedures and project requirements
	2.6	Project is continuously reviewed in relation to workplace safety, quality control, resources, timeframes, costs and equipment, in accordance with workplace procedures
3 Complete documentation	**3.1**	Power generation plant quality assurance documents and outage reports are provided, in accordance with project requirements, legislative obligations and workplace procedures
	3.2	Power generation plant and maintenance records are updated, in accordance with workplace procedures
	3.3	Power generation plant availability is declared on completion of project, in accordance with workplace procedures
	3.4	Project performance and completion is reviewed, in accordance with workplace procedures, against plan, and opportunities for improvement are documented

Foundation Skills

Foundation skills essential to performance are explicit in the performance criteria of this unit of competency.

Range of Conditions

Range is restricted to essential operating conditions and any other variables essential to the work environment.

Non-essential conditions may be found in the Companion Volume Implementation Guide.

Unit Mapping Information

This unit replaces and is equivalent to UEPOPS507B Conduct project management.

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Links

Companion Volume implementation guides are found in VETNet - https://vetnet.gov.au/Pages/TrainingDocs.aspx?q=1715b9fa-e7bd-441c-bb8d-cf22c9c825a8

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Assessment Requirements for UEPOPS507 Conduct project management

Modification History

Release 1. This is the first release of this unit of competency in the UEP Generation Training Package.

Performance Evidence

Evidence required to demonstrate competence in this unit must be relevant to and satisfy all the requirements of the elements, performance criteria and range of conditions on at least two separate occasions and includes:

- applying Work, Health and Safety (WHS)/Occupational Health and Safety (OHS) requirements including:
  - emergency procedures
  - risk control measures
  - safe working practices
- communicating with stakeholders
- completing documentation including recording procedures
- coordinating project management plan including contributing to project plan
- identifying conflict of power generating plant and project work requirements
- implementing legislation, industry standards, codes of practice and regulations
- managing timelines and resources including human resource requirements including contractual procedures
- monitoring budget expenditure
- planning and preparing project using project management principles
- responding to project plan deviations
- using quality control procedures

Knowledge Evidence

Evidence required to demonstrate competence in this unit must be relevant to and satisfy all the requirements of the elements, performance criteria and range of conditions and includes knowledge of:

- contractual obligations
- legislation, industry standards, codes of practice and regulations
- power generating plant and equipment, its location and operating parameters
- project management planning principles, techniques and concepts
- project management work coordination
- stakeholder management techniques including liaising with contractors

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- typical arrangements of power production plant
- WHS/OHS legislated requirements including:
  - emergency procedures
  - risk control measures
  - safe working practices
- workplace documentation
- workplace policies and procedures including:
  - quality control procedures
  - financial and contractual procedures

Assessment Conditions

As a minimum, assessors must satisfy applicable regulatory requirements, which include requirements in the Standards for Registered Training Organisations current at the time of assessment.

As a minimum, assessment must satisfy applicable regulatory requirements, which include requirements in the Standards for Registered Training Organisations current at the time of assessment.

Assessment processes and techniques must be appropriate to the language, literacy and numeracy requirements of the work being performed and the needs of the candidate.

Assessment must occur in workplace operational situations. Where this is not appropriate, assessment must occur in simulated workplace operational situations that reflect workplace conditions.

Resources for assessment must include access to:

- a range of relevant exercises, case studies and/or other simulations
- relevant and appropriate materials, tools, equipment and personal protective equipment currently used in industry
- applicable documentation including workplace procedures, industry standards, equipment specifications, regulations, codes of practice and operation manuals.

Links

Companion Volume implementation guides are found in VETNet - https://vetnet.gov.au/Pages/TrainingDocs.aspx?q=1715b9fa-e7bd-441c-bb8d-cf22c9c825a8

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UEPOPS508 Manage commissioning and decommissioning

Modification History

Release 1. This is the first release of this unit of competency in the UEP Generation Training Package.

Application

This unit involves the skills and knowledge required to manage the commissioning and decommissioning of power generation plant and equipment. It includes the reporting of progress and completion of work against key indicators however, it does not cover the removal or return of plant to service under normal routine maintenance situations.

Commissioning refers to the process where equipment and/or plant is installed or completed and is then tested to verify that it functions according to its' design specification. Decommissioning refers to the planned shutdown or removal of equipment and/or plant from usage.

Competency in this unit requires the ability to plan work, commissioning of plant or equipment, decommissioning of plant or equipment, removal or disassembly of plant or equipment, recommissioning of plant or equipment and completing work. Individuals will, in general, work as an operator with responsibility for managing commissioning and decommissioning, in a power generation facility.

Power generation plant operators are typically trained and authorised to isolate, prepare plant and issue permits to work.

No licensing, legislative or certification requirements apply to this unit at the time of publication.

Note: Workplace practice

The application of the skills and knowledge described in this unit may require a licence or training permit to practice in the workplace where work is carried out on gas and electrical installations. Additional conditions may apply under state and territory legislative and regulatory licensing requirements.

Pre-requisite Unit

There are no prerequisite units.

Competency Field

Operations

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Unit Sector

Electricity generation

Elements and Performance Criteria

ELEMENTS	PERFORMANCE CRITERIA
Elements describe the essential outcomes.	Performance criteria describe the performance needed to demonstrate achievement of the element.
1 Plan and prepare for work	**1.1** Management of commissioning and decommissioning tasks are identified from and are confirmed with personnel by detailed site inspection and with a meeting of stakeholders
	1.2 Work, Health and Safety (WHS)/Occupational Health and Safety (OHS) regulations, legislative requirements, industry standards, codes of practice, manufacturers' specifications, environmental obligations and workplace procedures are applied and managed throughout the commissioning and decommissioning of plant or equipment
	1.3 Resources to satisfy commissioning and decommissioning management plan are obtained and inspected for compliance
	1.4 Relevant plans, drawings and manuals are used, in accordance with the commissioning and decommissioning management plan
	1.5 Commissioning and decommissioning work is sequenced and prioritised, in accordance with commissioning and decommissioning management plan and site requirements
	1.6 Isolations and sequencing are managed, in accordance with commissioning and decommissioning management plan
	1.7 Potential hazards are identified, and risk control measures are implemented and managed, in accordance with commissioning and decommissioning management plan
	1.8 Work area is determined, in accordance with commissioning and decommissioning management plan,

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		manufacturers' requirements and site procedures
	1.9	Roles and responsibilities are assigned and managed, in accordance with commissioning and decommissioning management plan requirements
2 Commission plant or equipment	**2.1**	Isolations are confirmed, in accordance with commissioning and decommissioning management plan and site requirements
	2.2	Equipment is connected to energy or material sources, in accordance with commissioning and commissioning and decommissioning management plan
	2.3	Equipment is commissioned, in accordance with the commissioning and decommissioning management plan and manufactures' specifications
3 Decommission plant or equipment	**3.1**	Isolations are confirmed, in accordance with commissioning and decommissioning management plan and site requirements
	3.2	Equipment is disconnected from energy or material sources, in accordance with commissioning and decommissioning management plan
4 Removal and disassembly of plant or equipment	**4.1**	Isolations are confirmed, in accordance with commissioning and decommissioning management plan and site requirements
	4.2	Removal of plant or equipment, or disassembly of major components is carried out, in accordance with commissioning and decommissioning management plan
	4.3	Unused electrical conductors are isolated and terminated, in accordance with commissioning and decommissioning management plan
	4.4	Other sources of energy or materials, are terminated and blanked, in accordance with commissioning and decommissioning management plan
5 Recommission plant or equipment	**5.1**	Generation plant or equipment is de-isolated, in accordance with commissioning and decommissioning management plan and site requirements
	5.2	Preoperational checks are carried out on plant or equipment, in accordance with commissioning and decommissioning management plan, manufacturers'

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		recommendations and site requirements
	5.3	Sequence for recommissioning procedures are managed, in accordance with commissioning and decommissioning management plan
	5.4	Generation plant or equipment is tested for correct operation, in accordance with commissioning and decommissioning management plan, manufacturers' specifications and workplace procedures
	5.5	Generation plant or equipment performance is monitored and tested, in accordance with commissioning and decommissioning management plan
	5.6	Data is collected and referenced against manufacturers' specifications and any variances are recorded, in accordance with commissioning and decommissioning management plan
	5.7	Generation plant or equipment is adjusted to manufactures' specifications using appropriate techniques, in accordance with commissioning and decommissioning management plan
	5.8	Final inspections and performance data is collected, in accordance with commissioning and decommissioning management plan, to ensure compliance with manufacturers' specifications
6 Complete work	**6.1**	Work is completed and appropriate personnel are debriefed, in accordance with commissioning and decommissioning management plan and site requirements
	6.2	Work area is cleared of waste, in accordance with commissioning and decommissioning management plan and site requirements
	6.3	Specialist tools and equipment are maintained and stored, in accordance with commissioning and decommissioning management plan and manufacturers' recommendations.
	6.4	Completion details, including report and recommendations are finalised, in accordance with commissioning and decommissioning management plan and site requirements

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Foundation Skills

Foundation skills essential to performance are explicit in the performance criteria of this unit of competency.

Range of Conditions

Range is restricted to essential operating conditions and any other variables essential to the work environment.

Non-essential conditions may be found in the Companion Volume Implementation Guide.

Unit Mapping Information

This unit replaces and is equivalent to UEPOPS508B Manage commissioning/ decommissioning.

Links

Companion Volume implementation guides are found in VETNet - https://vetnet.gov.au/Pages/TrainingDocs.aspx?q=1715b9fa-e7bd-441c-bb8d-cf22c9c825a8

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Assessment Requirements for UEPOPS508 Manage commissioning and decommissioning

Modification History

Release 1. This is the first release of this unit of competency in the UEP Generation Training Package.

Performance Evidence

Evidence required to demonstrate competence in this unit must be relevant to and satisfy all the requirements of the elements, performance criteria and range of conditions on at least two separate occasions and includes:

- analysing data
- applying Work, Health and Safety (WHS)/Occupational Health and Safety (OHS) requirements including:
  - emergency procedures
  - hazard identification
  - risk control measures
- communicating with personnel
- completing work including reports
- identifying generation plant or equipment
- implementing legislation, industry standards, codes of practice and regulations
- interpreting manufacturers' specifications and manuals
- managing commissioning and decommissioning of generation plant or equipment
- performing decommissions, recommissions and isolations
- planning and preparing for work related to the management of commissioning and decommissioning tasks
- recommissioning generation plant or equipment
- removal and disassembly of generation plant or equipment
- safe working practices
- using testing and measuring equipment
- working with permit to work system

Knowledge Evidence

Evidence required to demonstrate competence in this unit must be relevant to and satisfy all the requirements of the elements, performance criteria and range of conditions and includes knowledge of:

- commission, decommission and recommission management plans including resourcing and implementation procedures

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- generation plant and equipment, its location and operating parameters including performance limits
- generation plant or equipment commissioning and decommissioning
- isolations
- legislation, industry standards, codes of practice and regulations
- manufacturers' specifications and manuals
- permit to work system
- report processes
- test and measurement equipment for analysis of data
- typical arrangements of power production plant
- WHS/OHS legislated requirements including:
  - emergency procedures
  - hazard identification
  - risk control measures
  - safe working practices
- workplace documentation
- workplace policies and procedures

Assessment Conditions

As a minimum, assessors must satisfy applicable regulatory requirements, which include requirements in the Standards for Registered Training Organisations current at the time of assessment.

As a minimum, assessment must satisfy applicable regulatory requirements, which include requirements in the Standards for Registered Training Organisations current at the time of assessment.

Assessment processes and techniques must be appropriate to the language, literacy and numeracy requirements of the work being performed and the needs of the candidate.

Assessment must occur in workplace operational situations. Where this is not appropriate, assessment must occur in simulated workplace operational situations that reflect workplace conditions.

Resources for assessment must include access to:

- a range of relevant exercises, case studies and/or other simulations
- relevant and appropriate materials, tools, equipment and personal protective equipment currently used in industry
- applicable documentation including workplace procedures, industry standards, equipment specifications, regulations, codes of practice and operation manuals.

Links

Companion Volume implementation guides are found in VETNet - https://vetnet.gov.au/Pages/TrainingDocs.aspx?q=1715b9fa-e7bd-441c-bb8d-cf22c9c825a8

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UEPOPS509 Manage quality control procedures

Modification History

Release 1. This is the first release of this unit of competency in the UEP Generation Training Package.

Application

This unit involves the skills and knowledge required to manage quality control procedures.

Quality control is a process through which a workplace seeks to ensure significant variations in quality are kept to a minimum. Quality control in a power generation facility will typically focus on procedures intended to ensure that personnel, plant and equipment operate smoothly and efficiently.

Competency in this unit requires the ability to plan for quality control, manage quality control, manage records and audit quality control procedures. Individuals will, in general, work as an operator with responsibility for quality control, in a power generation facility.

Power generation plant operators are typically trained and authorised to isolate, prepare plant and issue permits to work.

No licensing, legislative or certification requirements apply to this unit at the time of publication.

Note: Workplace practice

The application of the skills and knowledge described in this unit may require a licence or training permit to practice in the workplace where work is carried out on gas and electrical installations. Additional conditions may apply under state and territory legislative and regulatory licensing requirements.

Pre-requisite Unit

There are no prerequisite units.

Competency Field

Operations

Unit Sector

Electricity generation

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Elements and Performance Criteria

ELEMENTS	PERFORMANCE CRITERIA
Elements describe the essential outcomes.	Performance criteria describe the performance needed to demonstrate achievement of the element.
1 Plan for quality control	**1.1** Work, Health and Safety (WHS)/Occupational Health and Safety (OHS) legislative requirements, industry standards, codes of practice, manufacturers' specifications, environmental obligations and workplace procedures are applied and managed throughout quality control process
	1.2 Manufacturers' specifications and manuals are interpreted to meet quality control procedures as part of the Quality Management System
	1.3 Plant and equipment testing and inspecting programme is managed to determine conformance with manufacturers' specifications and quality control process and procedures
	1.4 Data is collected to determine cause of variations in quality control processes and procedures
	1.5 Quality control process improvement tools are used to identify and resolve quality control problems, in accordance with Quality Management System (QMS) requirements
	1.6 Quality process improvement techniques are used to manage work groups in the identification and resolution of quality control variances
2 Monitor quality control	**2.1** Monitoring equipment is checked and managed for correct calibration, and environmental conditions are reviewed and confirmed to ensure reliability and accuracy of test results
	2.2 Quality control process improvement measures are implemented and managed, in accordance with Quality Management System requirements and workplace procedures
	2.3 Deviation and fault data is managed, in accordance with workplace procedures and Quality Management System requirements

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	2.4	Changes in quality performance are actioned, in accordance with quality control procedures
	2.5	Independent inspections, tests and audits are managed, in accordance with quality control procedures
	2.6	Quality improvement system is monitored and managed, in accordance with quality control procedures
3 Manage quality control records	**3.1**	Calibration records of test equipment is managed, in accordance with quality control procedures and Quality Management System requirements
	3.2	Recording of quality control procedure updates are managed, in accordance with Quality Management System requirements
4 **Audit quality control procedures**	**4.1**	Quality Management System (QMS) is audited, and results are evaluated, in accordance with quality control procedures
	4.2	Audit results are documented and report with recommendations is reviewed and confirmed with appropriate personnel, in accordance with quality control procedures

Foundation Skills

Foundation skills essential to performance are explicit in the performance criteria of this unit of competency.

Range of Conditions

Range is restricted to essential operating conditions and any other variables essential to the work environment.

Non-essential conditions may be found in the Companion Volume Implementation Guide.

Unit Mapping Information

This unit replaces and is equivalent to UEPOPS509B Manage quality control procedures.

Links

Companion Volume implementation guides are found in VETNet - https://vetnet.gov.au/Pages/TrainingDocs.aspx?q=1715b9fa-e7bd-441c-bb8d-cf22c9c825a8

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Assessment Requirements for UEPOPS509 Manage quality control procedures

Modification History

Release 1. This is the first release of this unit of competency in the UEP Generation Training Package.

Performance Evidence

Evidence required to demonstrate competence in this unit must be relevant to and satisfy all the requirements of the elements, performance criteria and range of conditions on at least two separate occasions and includes:

- applying Work, Health and Safety (WHS)/Occupational Health and Safety (OHS) requirements including:
  - emergency procedures
  - risk control measures
  - safe working practices
- auditing quality control procedures
- communicating with personnel
- completing quality control documentation
- identifying quality control procedure variances
- implementing legislation, industry standards, codes of practice and regulations
- interpreting manufacturers' specifications and manuals
- managing quality control including procedures, processes and techniques
- organising quality control procedure audits, inspections and tests
- performing analysis of Quality Management System (QMS) and quality control procedures
- planning quality control

Knowledge Evidence

Evidence required to demonstrate competence in this unit must be relevant to and satisfy all the requirements of the elements, performance criteria and range of conditions and includes knowledge of:

- data analysis of quality variances
- legislation, industry standards, codes of practice and regulations
- liaising with contractors
- manufacturers' specifications and manuals
- monitoring equipment, procedures and records
- plant and equipment, its location and operating parameters

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- quality control procedures, processes and techniques
- Quality Management System (QMS)
- typical arrangements of power production plant
- WHS/OHS legislated requirements including:
  - emergency procedures
  - risk control measures
  - safe working practices
- workplace documentation
- workplace policies and procedures

Assessment Conditions

As a minimum, assessors must satisfy applicable regulatory requirements, which include requirements in the Standards for Registered Training Organisations current at the time of assessment.

As a minimum, assessment must satisfy applicable regulatory requirements, which include requirements in the Standards for Registered Training Organisations current at the time of assessment.

Assessment processes and techniques must be appropriate to the language, literacy and numeracy requirements of the work being performed and the needs of the candidate.

Assessment must occur in workplace operational situations. Where this is not appropriate, assessment must occur in simulated workplace operational situations that reflect workplace conditions.

Resources for assessment must include access to:

- a range of relevant exercises, case studies and/or other simulations
- relevant and appropriate materials, tools, equipment and personal protective equipment currently used in industry
- applicable documentation including workplace procedures, industry standards, equipment specifications, regulations, codes of practice and operation manuals.

Links

Companion Volume implementation guides are found in VETNet - https://vetnet.gov.au/Pages/TrainingDocs.aspx?q=1715b9fa-e7bd-441c-bb8d-cf22c9c825a8

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UEPOPS510 Monitor power generation plant reliability

Modification History

Release 1. This is the first release of this unit of competency in the UEP Generation Training Package.

Application

This unit involves the skills and knowledge required to monitor power generating plant reliability through data assessment.

Data is collected and assessed to accurately evaluate the impact of power generating plant reliability in the operation of power generation facilities.

Competency in this unit requires the ability to collect data, perform calculations, evaluate and analyse information and produce reports and complete work. Individuals will, in general, work under supervision as an operator, in a power generation facility.

Power generation plant operators are typically trained and authorised to isolate, prepare plant and issue permits to work.

No licensing, legislative or certification requirements apply to this unit at the time of publication.

Note: Workplace practice

The application of the skills and knowledge described in this unit may require a licence or training permit to practice in the workplace where work is carried out on gas and electrical installations. Additional conditions may apply under state and territory legislative and regulatory licensing requirements.

Pre-requisite Unit

There are no prerequisite units.

Competency Field

Operations

Unit Sector

Electricity generation

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Elements and Performance Criteria

ELEMENTS	PERFORMANCE CRITERIA
Elements describe the essential outcomes.	Performance criteria describe the performance needed to demonstrate achievement of the element.
1 Collect data	**1.1** Information and data is collected, in accordance with legislative requirements, industry standards and workplace procedures
	1.2 Generating plant is identified and its' status is established, in accordance with workplace procedures
	1.3 Tools and equipment are identified and acquired, in accordance with workplace procedures
	1.4 Specialist assistance or equipment is obtained, as required, in accordance with workplace procedures
	1.5 Information collected is recorded and ranked, in accordance with legislative requirements, industry standards and workplace procedures
2 Perform calculations	**2.1** Performance calculations are undertaken, in accordance with legislative requirements, industry standards and workplace procedures
	2.2 Calculations are checked for accuracy, in accordance with workplace procedures
3 Analyse information	**3.1** Technical and operational information is analysed, in accordance with workplace procedures, to identify abnormal generating plant operating conditions
	3.2 Causes of abnormal generating plant conditions are identified, in accordance with workplace procedures
	3.3 Generating plant integrity is maintained, in accordance with workplace procedures, and in consultation with relevant personnel and operational documentation
	3.4 Need for specialist assistance is determined, in accordance with workplace procedures
4 Produce report and complete work	**4.1** Information and data is documented, in accordance with workplace procedures
	4.2 Reports are produced, in accordance with legislative requirements, industry standards and workplace

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procedures

4.3 Actions to rectify generating plant loss of reliability are ranked, and recommendations are made to appropriate personnel, in accordance with workplace procedures

4.4 Implementation of recommendations is monitored, in accordance with workplace procedures, to ensure generating plant reliability

Foundation Skills

Foundation skills essential to performance are explicit in the performance criteria of this unit of competency.

Range of Conditions

Range is restricted to essential operating conditions and any other variables essential to the work environment.

Non-essential conditions may be found in the Companion Volume Implementation Guide.

Unit Mapping Information

This unit replaces and is equivalent to UEPOPS510B Monitor power generation plant reliability.

Links

Companion Volume implementation guides are found in VETNet - https://vetnet.gov.au/Pages/TrainingDocs.aspx?q=1715b9fa-e7bd-441c-bb8d-cf22c9c825a8

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Assessment Requirements for UEPOPS510 Monitor power generation plant reliability

Modification History

Release 1. This is the first release of this unit of competency in the UEP Generation Training Package.

Performance Evidence

Evidence required to demonstrate competence in this unit must be relevant to and satisfy all the requirements of the elements, performance criteria and range of conditions on at least two separate occasions and includes:

- applying Work, Health and Safety (WHS)/Occupational Health and Safety (OHS) requirements including:
  - emergency procedures
  - risk control measures
  - site safety procedures
- collecting data
- communicating with personnel
- determining generation plant reliability performance
- evaluating and analysing information and data
- identifying generating plant status
- implementing legislation, industry standards, codes of practice and regulations
- interpreting manufacturers' specifications and manuals
- performing calculations
- producing reports and completing work
- recording and analysing data using analysis techniques and tools

Knowledge Evidence

Evidence required to demonstrate competence in this unit must be relevant to and satisfy all the requirements of the elements, performance criteria and range of conditions and includes knowledge of:

- calculation methods
- data collection and analysing techniques
- generation plant and equipment, its location and operating parameters
- generation plant monitoring processes and procedures
- generation plant status
- legislation, industry standards, codes of practice and regulations

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- manufacturers' specifications and manuals
- typical arrangements of power production plant
- WHS/OHS legislated requirements including:
  - emergency procedures
  - risk control measures
  - site safety procedures
- workplace documentation
- workplace policies and procedures

Assessment Conditions

As a minimum, assessors must satisfy applicable regulatory requirements, which include requirements in the Standards for Registered Training Organisations current at the time of assessment.

As a minimum, assessment must satisfy applicable regulatory requirements, which include requirements in the Standards for Registered Training Organisations current at the time of assessment.

Assessment processes and techniques must be appropriate to the language, literacy and numeracy requirements of the work being performed and the needs of the candidate.

Assessment must occur in workplace operational situations. Where this is not appropriate, assessment must occur in simulated workplace operational situations that reflect workplace conditions.

Resources for assessment must include access to:

- a range of relevant exercises, case studies and/or other simulations
- relevant and appropriate materials, tools, equipment and personal protective equipment currently used in industry
- applicable documentation including workplace procedures, industry standards, equipment specifications, regulations, codes of practice and operation manuals.

Links

Companion Volume implementation guides are found in VETNet - https://vetnet.gov.au/Pages/TrainingDocs.aspx?q=1715b9fa-e7bd-441c-bb8d-cf22c9c825a8

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UEPOPS511 Tune process plant and equipment

Modification History

Release 1. This is the first release of this unit of competency in the UEP Generation Training Package.

Application

This unit involves the skills and knowledge required to complete the investigation, nomination and adjustment of tuning parameters associated with power generation process plant and equipment

Tuning is a method in which one or more parameters of power generation plant and equipment are adjusted up or down to achieve an improved or specified result. Tuning will include testing and reviewing power generation process plant and equipment to identify faults.

Competency in this unit requires the ability to plan and prepare to tune generation process plant and equipment, testing and implementing process plant tuning and completing documentation. Individuals will, in general, work under supervision as an operator, in a power generation facility.

Power generation plant operators are typically trained and authorised to isolate, prepare plant and issue permits to work.

No licensing, legislative or certification requirements apply to this unit at the time of publication.

Note: Workplace practice

The application of the skills and knowledge described in this unit may require a licence or training permit to practice in the workplace where work is carried out on gas and electrical installations. Additional conditions may apply under state and territory legislative and regulatory licensing requirements.

Pre-requisite Unit

There are no prerequisite units.

Competency Field

Operations

Unit Sector

Electricity generation

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Elements and Performance Criteria

ELEMENTS	PERFORMANCE CRITERIA
Elements describe the essential outcomes.	Performance criteria describe the performance needed to demonstrate achievement of the element.
1 Plan and prepare work	**1.1** Tuning requirements for process plant and equipment are identified from appropriate personnel and documentation, in accordance with workplace procedures
	1.2 Resource and equipment requirements are identified, in accordance with workplace procedures
	1.3 Process plant availability, capability and limitations are identified, in accordance with workplace procedures
	1.4 Testing and monitoring equipment are connected, in accordance with workplace procedures, testing requirements and process plant integrity
	1.5 Initial operating state for process plant is maintained for testing, in accordance with workplace procedures, legislative requirements and industry standards
	1.6 Test procedures are identified and recording documentation or equipment is prepared, in accordance with workplace procedures
	1.7 Testing equipment is calibrated, in accordance with workplace procedures, industry standards and manufacturers' specifications
2 Test plant and implement tuning	**2.1** Field instrumentation and control elements are checked for calibration and correct operation, in accordance with workplace procedures and manufacturers' specifications
	2.2 Testing and tuning is performed, in accordance with workplace procedures and tuning program requirements
	2.3 Variations are reassessed and accommodated to enable test objectives to be met
	2.4 Testing results are analysed with reference to desired outcomes, and new settings for process plant are determined, in accordance with workplace procedures
	2.5 Accuracy of test results is assessed through analysis of

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		test data, in accordance with workplace procedures
	2.6	Process plant is retuned to achieve desired outcomes, in accordance with workplace procedures
3 Complete documentation	**3.1**	Records are updated and documentation is retained, in accordance with workplace procedures
	3.2	Changes to equipment operational settings are recommended to appropriate personnel, in accordance with workplace procedures
	3.3	Implementation of recommendations are monitored, in accordance with workplace procedures

Foundation Skills

Foundation skills essential to performance are explicit in the performance criteria of this unit of competency.

Range of Conditions

Range is restricted to essential operating conditions and any other variables essential to the work environment.

Non-essential conditions may be found in the Companion Volume Implementation Guide.

Unit Mapping Information

This unit replaces and is equivalent to UEPOPS511B Tune process plant and equipment.

Links

Companion Volume implementation guides are found in VETNet - https://vetnet.gov.au/Pages/TrainingDocs.aspx?q=1715b9fa-e7bd-441c-bb8d-cf22c9c825a8

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Assessment Requirements for UEPOPS511 Tune process plant and equipment

Modification History

Release 1. This is the first release of this unit of competency in the UEP Generation Training Package.

Performance Evidence

Evidence required to demonstrate competence in this unit must be relevant to and satisfy all the requirements of the elements, performance criteria and range of conditions on at least two separate occasions and includes:

- analysing test results
- applying Work, Health and Safety (WHS)/Occupational Health and Safety (OHS) legislated requirements including:
  - emergency procedures
  - risk control measures
  - safety procedures
- communicating with personnel
- completing documentation using recording procedures
- coordinating testing operations using monitoring procedures
- implementing legislation, industry standards, codes of practice and regulations
- interpreting manufacturers specifications and manuals
- locating process plant and equipment
- planning and preparing for tuning
- setting up and using testing or tuning equipment
- translating and using tuning parameters and settings
- using data analysis techniques and tools
- utilising testing and tuning techniques for process plant and equipment

Knowledge Evidence

Evidence required to demonstrate competence in this unit must be relevant to and satisfy all the requirements of the elements, performance criteria and range of conditions and includes knowledge of:

- analysis methods and tools
- legislation, industry standards, codes of practice and regulations
- manufacturers' specifications and manuals
- power generation process plant and equipment, its location and operating parameters

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- tuning and testing techniques and processes
- tuning parameters and settings
- typical arrangements of power production plant
- WHS/OHS legislation including:
  - safety procedures
  - emergency procedures
  - risk control measures
- workplace documentation
- workplace policies and procedures

Assessment Conditions

As a minimum, assessors must satisfy applicable regulatory requirements, which include requirements in the Standards for Registered Training Organisations current at the time of assessment.

As a minimum, assessment must satisfy applicable regulatory requirements, which include requirements in the Standards for Registered Training Organisations current at the time of assessment.

Assessment processes and techniques must be appropriate to the language, literacy and numeracy requirements of the work being performed and the needs of the candidate.

Assessment must occur in workplace operational situations. Where this is not appropriate, assessment must occur in simulated workplace operational situations that reflect workplace conditions.

Resources for assessment must include access to:

- a range of relevant exercises, case studies and/or other simulations
- relevant and appropriate materials, tools, equipment and personal protective equipment currently used in industry
- applicable documentation including workplace procedures, industry standards, equipment specifications, regulations, codes of practice and operation manuals.

Links

Companion Volume implementation guides are found in VETNet - https://vetnet.gov.au/Pages/TrainingDocs.aspx?q=1715b9fa-e7bd-441c-bb8d-cf22c9c825a8

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UEPOPS512 Manage high voltage network system

Modification History

Release 1. This is the first release of this unit of competency in the UEP Generation Training Package.

Application

This unit involves the skills and knowledge required to manage a High Voltage (H.V.) network system that may be interconnected, remote or isolated.

Operators seek to optimise and manage H.V. network systems that are deployed to supply, transfer and store electrical power through efficient and safe operations at power generation facilities. This includes identifying faults, taking corrective actions and using protection programs to ensure network system stability.

Competency in this unit requires the ability to plan network system operations, manage and control network system, analyse and respond to network system faults or incidents, review incident response and preventative procedures and the completion of all documentation. Individuals will, in general, work as an operator with responsibility for managing a H.V. network system, in a power generation facility.

Power generation plant operators are typically trained and authorised to isolate, prepare plant and issue permits to work.

No licensing, legislative or certification requirements apply to this unit at the time of publication.

Note: Workplace practice

The application of the skills and knowledge described in this unit may require a licence or training permit to practice in the workplace where work is carried out on gas and electrical installations. Additional conditions may apply under state and territory legislative and regulatory licensing requirements.

Pre-requisite Unit

UEPOPS420 Coordinate the network system.

Competency Field

Operations

Unit Sector

Electricity generation

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Elements and Performance Criteria

ELEMENTS	PERFORMANCE CRITERIA
Elements describe the essential outcomes.	Performance criteria describe the performance needed to demonstrate achievement of the element.
1 Plan and prepare network system operations	**1.1** Information and documentation to determine power generation network system status is assessed and evaluated, in accordance with High Voltage (H.V.) system operating requirements
	1.2 Power generation network system and associated equipment operational prerequisites are established, in accordance with H.V. system operating procedures
	1.3 Sequence for operation of power generation network system sections and equipment is created for a range of potential scenarios, in accordance with H.V. system operating procedures
	1.4 Power generation network system forecast is based on assessment of data and relevant information, in accordance with H.V. system operating procedures
2 Manage and control network system	**2.1** Power generation network system is operated and managed, in accordance with H.V. system operating procedures
	2.2 Power generation network system demand is managed using a contingency plan and strategies to maintain quality of supply, in accordance with legislative requirements and H.V. system operating procedures
	2.3 Power generation network system voltage and current requirements are assessed, evaluated and managed to maintain stability and H.V. system integrity
	2.4 Voltage load profiles are identified and adhered to, in accordance with power generation network system, to minimise transmission losses
	2.5 Power generation network system load shedding sequence and priorities are monitored and managed, to ensure H.V. system integrity
	2.6 Power generation network system data is monitored and managed, for normal operation or to detect deviations

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	2.7	Corrective actions to rectify abnormalities in power generation network system are implemented, following assessment of data, in accordance with H.V. system operating procedures
	2.8	Resources to meet power generation network system requirements are managed, in accordance with H.V. system operating procedures
3 Analyse and respond to network system faults	**3.1**	Causes of power generation abnormal network system operating conditions are identified by analysing technical and operational information, in accordance with H.V. system operating procedures
	3.2	Operation and management of power generation network system protection program is evaluated to determine nature and cause of faults
	3.3	Communication with key stakeholders is established managed, to assist in identifying nature and source of H.V. system interference
	3.4	Corrective action is taken, in accordance with H.V. system operating procedures
	3.5	Power generation network system integrity and personnel safety are managed, in accordance with H.V. system operating procedures, and in consultation with appropriate personnel and technical and operational documentation including contingency plans
4 Review incident response and preventative procedures	**4.1**	Power generation facility network system incident responses are assessed and reviewed, in accordance with system operating procedures
	4.2	Alternative responses to contingencies are identified and assessed, in accordance with system operating procedures
	4.3	Alternative responses to contingencies are documented and managed, in accordance with system operating procedures
5 Complete documentation	**5.1**	Network system problems, movements and status is reported, in accordance with workplace and system operating procedures
	5.2	Documentation is updated, in accordance with workplace procedures

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Foundation Skills

Foundation skills essential to performance are explicit in the performance criteria of this unit of competency.

Range of Conditions

Range is restricted to essential operating conditions and any other variables essential to the work environment.

Non-essential conditions may be found in the Companion Volume Implementation Guide.

Unit Mapping Information

This unit replaces and is equivalent to UEPOPS512B Manage the network system.

Links

Companion Volume implementation guides are found in VETNet - https://vetnet.gov.au/Pages/TrainingDocs.aspx?q=1715b9fa-e7bd-441c-bb8d-cf22c9c825a8

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Assessment Requirements for UEPOPS512 Manage high voltage network system

Modification History

Release 1. This is the first release of this unit of competency in the UEP Generation Training Package.

Performance Evidence

Evidence required to demonstrate competence in this unit must be relevant to and satisfy all the requirements of the elements, performance criteria and range of conditions on at least two separate occasions and includes:

- analysing and responding to faults and abnormal H.V. network system operating conditions using diagnostic techniques
- analysing and responding to H.V. network system faults or incidents using data analysis techniques and tools
- ascertaining type of H.V. network system
- applying Work, Health and Safety (WHS)/Occupational Health and Safety (OHS) requirements including:
  - emergency procedures and techniques
  - risk control measures
  - safe working practices and procedures
- communicating with key stakeholders
- completing documentation using recording procedures
- directing and coordinating personnel and stakeholders
- identifying power generating facility's plant status
- implementing legislation, industry standards, codes of practice and regulations
- managing and controlling H.V. network system operations
- planning High Voltage (H.V.) network system operations
- preparing for H.V. network system operations
- reviewing incident response and preventative procedures
- selecting appropriate load shedding
- using permit to work system
- working with contingency plans

Knowledge Evidence

Evidence required to demonstrate competence in this unit must be relevant to and satisfy all the requirements of the elements, performance criteria and range of conditions and includes knowledge of:

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- contingency plans
- H.V. load shedding principles
- H.V. network system types and characteristics
- legislation, industry standards, codes of practice and regulations
- permit to work system
- power generation plant and equipment, its location and operating parameters
- power generation plant status
- typical arrangements of power production plant
- WHS/OHS legislated requirements including:
  - emergency procedures and techniques
  - risk control measures
  - safe working practices and procedures
- workplace documentation
- workplace policies and procedures

Assessment Conditions

As a minimum, assessors must satisfy applicable regulatory requirements, which include requirements in the Standards for Registered Training Organisations current at the time of assessment.

As a minimum, assessment must satisfy applicable regulatory requirements, which include requirements in the Standards for Registered Training Organisations current at the time of assessment.

Assessment processes and techniques must be appropriate to the language, literacy and numeracy requirements of the work being performed and the needs of the candidate.

Assessment must occur in workplace operational situations. Where this is not appropriate, assessment must occur in simulated workplace operational situations that reflect workplace conditions.

Resources for assessment must include access to:

- a range of relevant exercises, case studies and/or other simulations
- relevant and appropriate materials, tools, equipment and personal protective equipment currently used in industry
- applicable documentation including workplace procedures, industry standards, equipment specifications, regulations, codes of practice and operation manuals.

Links

Companion Volume implementation guides are found in VETNet - https://vetnet.gov.au/Pages/TrainingDocs.aspx?q=1715b9fa-e7bd-441c-bb8d-cf22c9c825a8

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UEPOPS513 Manage operational crisis to maintain or restore power system integrity

Modification History

Release 1. This is the first release of this unit of competency in the UEP Generation Training Package.

Application

This unit involves the skills and knowledge required to manage a crisis of a magnitude which affects the integrity and effectiveness of the power generation facility's system.

A crisis is defined as a significant threat to power generation operations that can have negative consequences if not handled with care. The risk management system ensures that the power generation facility identifies, assesses and prioritises risks and manages the application of resources to monitor and control the impact of potentially hazardous events.

Competency in this unit requires the ability to identify a crisis, establish a contingency plan, establish communications, manage crisis documents and review the crisis and response. Individuals will, in general, work as an operator with responsibility for risk management, in a power generation facility.

Power generation plant operators are typically trained and authorised to isolate, prepare plant and issue permits to work.

No licensing, legislative or certification requirements apply to this unit at the time of publication.

Note: Workplace practice

The application of the skills and knowledge described in this unit may require a licence or training permit to practice in the workplace where work is carried out on gas and electrical installations. Additional conditions may apply under state and territory legislative and regulatory licensing requirements.

Pre-requisite Unit

There are no prerequisite units.

Competency Field

Operations

Unit Sector

Electricity generation

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Elements and Performance Criteria

ELEMENTS	PERFORMANCE CRITERIA
Elements describe the essential outcomes.	Performance criteria describe the performance needed to demonstrate achievement of the element.
1 Identify crisis	**1.1** Operational crisis and implications are identified and assessed, in accordance with risk management system and workplace procedures
	1.2 Secondary threats from crisis events are identified and monitored, in accordance with Risk Management System and workplace procedures
	1.3 Network system configuration or power generation capability is evaluated, in accordance with risk management system and workplace procedures
	1.4 Data determining network system and power generation status is assessed and evaluated, in accordance with risk management system and workplace procedures
	1.5 External information is collated, assessed and managed, in accordance with risk management system and workplace procedures
	1.6 Probable cause of crisis is identified from available information and resources, in accordance with risk management system and workplace procedures
	1.7 Crisis team is activated and individual roles and responsibilities are identified and managed, in accordance with risk management system and workplace procedures
2 Implement contingency plan	**2.1** Contingency and emergency response plans are implemented, using risk management system documentation and workplace procedures
	2.2 Additional resources are identified, in accordance with risk management system and workplace procedures
	2.3 Alternate strategies to cater for crisis variations are implemented, in consultation with key stakeholders, in accordance with risk management system and workplace procedures
3 Implement	**3.1** Communication links with external authorities are established and implemented, in accordance with risk

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communication		management system and workplace procedures, to ensure coordination of resources
	3.2	Communication with key stakeholders is established and implemented to disseminate information, in accordance with risk management system and workplace procedures
	3.3	Customers are assisted, in accordance with risk management system policies and workplace procedures
4 Manage crisis	**4.1**	Crisis response is managed, in accordance with risk management system, workplace procedures and site requirements
	4.2	Crisis events and responses are prioritised according to related risk and the needs of key stakeholders, in accordance with risk management system and workplace procedures
	4.3	Impact of secondary threats are managed, in accordance with risk management system and workplace procedures
	4.4	Contingency and emergency response plans are actioned and managed, in accordance with risk management system policies and workplace procedures
	4.5	Additional resources are managed and directed, in accordance with risk management system and workplace procedures
	4.6	Restoration strategies are monitored, evaluated and adjusted as required, in accordance with risk management system and workplace procedures
	4.7	Power generation systems are stabilised and integrity is maintained, in accordance with risk management system and workplace procedures
5 Document and review crisis and response	**5.1**	Equipment failure or problems are identified and managed, in accordance with risk management system procedures
	5.2	Crisis feedback from key stakeholders is analysed, in accordance with risk management system and workplace procedures
	5.3	Crisis reports and findings are distributed to appropriate personnel, in accordance with risk management system and workplace procedures

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5.4 Improvements to crisis management plans, processes and procedures are recommended to appropriate personnel and key stakeholders, in accordance with risk management system and workplace procedures

5.5 Alternative crisis management strategies are identified and analysed, and recommendations are communicated to appropriate personnel and key stakeholders, in accordance with risk management system and workplace procedures

Foundation Skills

Foundation skills essential to performance are explicit in the performance criteria of this unit of competency.

Range of Conditions

Range is restricted to essential operating conditions and any other variables essential to the work environment.

Non-essential conditions may be found in the Companion Volume Implementation Guide.

Unit Mapping Information

This unit replaces and is equivalent to UEPOPS513B Manage operational crisis to maintain/restore power system integrity.

Links

Companion Volume implementation guides are found in VETNet - https://vetnet.gov.au/Pages/TrainingDocs.aspx?q=1715b9fa-e7bd-441c-bb8d-cf22c9c825a8

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Assessment Requirements for UEPOPS513 Manage operational crisis to maintain or restore power system integrity

Modification History

Release 1. This is the first release of this unit of competency in the UEP Generation Training Package.

Performance Evidence

Evidence required to demonstrate competence in this unit must be relevant to and satisfy all the requirements of the elements, performance criteria and range of conditions on at least two separate occasions and includes:

- applying Work, Health and Safety (WHS)/Occupational Health and Safety (OHS) requirements including:
  - emergency procedures and techniques
  - safe working practices
  - site safety procedures
- communicating with personnel during a crisis event
- controlling crisis emergency situations
- detecting plant status including interpreting remote indication of plant status and condition
- determining corrective actions using data analysis techniques and tools
- documenting and reviewing crisis events and responses
- identifying crisis events
- implementing legislation, industry standards, codes of practice and regulations
- instigating contingency and emergency response plans
- managing crisis including oversight of personnel
- recognising abnormal plant operating conditions using diagnostic techniques
- responding to stakeholder feedback
- utilising communication techniques and methods including recording procedures
- working with and managing the risk management system

Knowledge Evidence

Evidence required to demonstrate competence in this unit must be relevant to and satisfy all the requirements of the elements, performance criteria and range of conditions and includes knowledge of:

- communication equipment, techniques and procedures
- contingency and emergency response plans
- control techniques and methods for crisis events

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- legislation, industry standards, codes of practice and regulations
- manufacturers' specifications and manuals
- power generation plant and equipment, its location and operating parameters
- power generation plant status
- Risk Management Systems
- risk mitigation processes
- role of external authorities and agencies
- stakeholder liaison and feedback
- stakeholder management techniques including liaising with contractors and clients
- types of crises events
- typical arrangements of power production plant
- WHS/OHS legislated requirements including
  - emergency procedures and techniques
  - safe working practices
  - site safety procedures
- workplace documentation workplace policies and procedures

Assessment Conditions

As a minimum, assessors must satisfy applicable regulatory requirements, which include requirements in the Standards for Registered Training Organisations current at the time of assessment.

As a minimum, assessment must satisfy applicable regulatory requirements, which include requirements in the Standards for Registered Training Organisations current at the time of assessment.

Assessment processes and techniques must be appropriate to the language, literacy and numeracy requirements of the work being performed and the needs of the candidate.

Assessment must occur in workplace operational situations. Where this is not appropriate, assessment must occur in simulated workplace operational situations that reflect workplace conditions.

Resources for assessment must include access to:

- a range of relevant exercises, case studies and/or other simulations
- relevant and appropriate materials, tools, equipment and personal protective equipment currently used in industry
- applicable documentation including workplace procedures, industry standards, equipment specifications, regulations, codes of practice and operation manuals.

Links

Companion Volume implementation guides are found in VETNet - https://vetnet.gov.au/Pages/TrainingDocs.aspx?q=1715b9fa-e7bd-441c-bb8d-cf22c9c825a8

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UEPOPS514 Control hydro generation pumping

Modification History

Release 1. This is the first release of this unit of competency in the UEP Generation Training Package.

Application

This unit involves the skills and knowledge required to undertake the control of hydro generation pumping through remote control of hydro generating plant.

Hydro pumping is a system for generating hydroelectric power for peak periods. This is performed by pumping water from a lower to a higher reservoir during low demand periods and then releasing it during peak periods.

Competency in this unit requires the ability to maintain key indicator limits, operate remote hydro plant, maintain policies and procedures and complete work. Individuals will, in general, work as an operator, in a power generation facility.

Power generation plant operators are typically trained and authorised to isolate, prepare plant and issue permits to work.

No licensing, legislative or certification requirements apply to this unit at the time of publication.

Note: Workplace practice

The application of the skills and knowledge described in this unit may require a licence or training permit to practice in the workplace where work is carried out on gas and electrical installations. Additional conditions may apply under state and territory legislative and regulatory licensing requirements.

Pre-requisite Unit

There are no prerequisite units.

Competency Field

Operations

Unit Sector

Electricity generation

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Elements and Performance Criteria

ELEMENTS	PERFORMANCE CRITERIA
Elements describe the essential outcomes.	Performance criteria describe the performance needed to demonstrate achievement of the element.
1 Maintain key indicator limits	**1.1** Pond levels, power station discharges, plant voltage and current limits, frequency and time errors are maintained, in accordance with workplace procedures and manufacturers' specifications
	1.2 Hydro generation plant is run at peak efficiency, or to the load schedule, avoiding rough running zones, in accordance with workplace procedures
2 Operate remote hydro plant	**2.1** Hydro generation power plant is remotely stopped, started, loaded and unloaded, in accordance with workplace procedures and the operating regimes dictated by the electricity generation schedule
	2.2 Power generating plant is remotely switched in and out of synchronous condenser operation, as required, in accordance with workplace procedures
3 Maintain policies and procedures	**3.1** Communication procedures used to alert public of increased river flows, in accordance with workplace procedures
	3.2 Minimum river flows are maintained, in accordance with workplace procedures and agreed limits
	3.3 Water storage levels are monitored and maintained, in accordance with workplace procedures, legislative requirements and policy guidelines
4 Complete documentation	**4.1** Equipment problems, movements, and status are reported, in accordance with workplace procedures
	4.2 Documentation is updated, in accordance with workplace procedures

Foundation Skills

Foundation skills essential to performance are explicit in the performance criteria of this unit of competency.

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Range of Conditions

Range is restricted to essential operating conditions and any other variables essential to the work environment.

Non-essential conditions may be found in the Companion Volume Implementation Guide.

Unit Mapping Information

This unit replaces and is equivalent to UEPOPS514B Control hydro generation and pumping.

Links

Companion Volume implementation guides are found in VETNet - https://vetnet.gov.au/Pages/TrainingDocs.aspx?q=1715b9fa-e7bd-441c-bb8d-cf22c9c825a8

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Assessment Requirements for UEPOPS514 Control hydro generation pumping

Modification History

Release 1. This is the first release of this unit of competency in the UEP Generation Training Package.

Performance Evidence

Evidence required to demonstrate competence in this unit must be relevant to and satisfy all the requirements of the elements, performance criteria and range of conditions on at least two separate occasions and includes:

- applying Work, Health and Safety (WHS)/Occupational Health and Safety (OHS) requirements including:
  - emergency procedures
  - risk control measures
  - safe working practices
- communicating dam and river levels to public
- completing documentation using recording procedures
- determining remote indication of hydro plant status and condition
- identifying hydro power generating plant status
- implementing legislation, industry standards, codes of practice and regulations
- interpreting manufacturers' specifications and manuals
- maintaining policies and procedures
- operating remote hydro plant within design parameters
- preserving hydro generation pumping key indicator limits
- recognising abnormal hydro plant operating conditions and determining corrective actions

Knowledge Evidence

Evidence required to demonstrate competence in this unit must be relevant to and satisfy all the requirements of the elements, performance criteria and range of conditions and includes knowledge of:

- communication required by public and stakeholders about dam or river levels
- hydro power generating plant and equipment, its location and operating parameters
- legislation, industry standards, codes of practice and regulations
- manufacturers' specifications and manuals
- typical arrangements of hydro power production plant including:
  - dam types and characteristics

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  - hydro generator types and characteristics
  - hydro power generating equipment status
  - hydro turbine types and characteristics including hydro turbine governors
- WHS/OHS legislated requirements including:
  - emergency procedures
  - risk control measures
  - safe working practices
- workplace documentation
- workplace policies and procedures

Assessment Conditions

As a minimum, assessors must satisfy applicable regulatory requirements, which include requirements in the Standards for Registered Training Organisations current at the time of assessment.

As a minimum, assessment must satisfy applicable regulatory requirements, which include requirements in the Standards for Registered Training Organisations current at the time of assessment.

Assessment processes and techniques must be appropriate to the language, literacy and numeracy requirements of the work being performed and the needs of the candidate.

Assessment must occur in workplace operational situations. Where this is not appropriate, assessment must occur in simulated workplace operational situations that reflect workplace conditions.

Resources for assessment must include access to:

- a range of relevant exercises, case studies and/or other simulations
- relevant and appropriate materials, tools, equipment and personal protective equipment currently used in industry
- applicable documentation including workplace procedures, industry standards, equipment specifications, regulations, codes of practice and operation manuals.

Links

Companion Volume implementation guides are found in VETNet - https://vetnet.gov.au/Pages/TrainingDocs.aspx?q=1715b9fa-e7bd-441c-bb8d-cf22c9c825a8

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UEPOPS515 Coordinate power generation

Modification History

Release 1. This is the first release of this unit of competency in the UEP Generation Training Package.

Application

This unit involves the skills and knowledge required to coordinate the operation and control of multiple power generators sharing load under the control of one operator.

Operators are responsible for starting and stopping power generators. Depending on need this includes synchronising and adjusting voltage output, troubleshooting, fixing problems and responding to emergencies.

Competency in this unit requires the ability to plan for power generating plant operations, operate power generator and excitation system, control generation of electrical energy, coordinate generation control, monitor system and/or power generating plant and the completion of all documentation. Individuals will, in general, work as an operator with responsibility for coordinating power generation, in a power generation facility.

Power generation plant operators are typically trained and authorised to isolate, prepare plant and issue permits to work.

No licensing, legislative or certification requirements apply to this unit at the time of publication.

Note: Workplace practice

The application of the skills and knowledge described in this unit may require a licence or training permit to practice in the workplace where work is carried out on gas and electrical installations. Additional conditions may apply under state and territory legislative and regulatory licensing requirements.

Pre-requisite Unit

There are no prerequisite units.

Competency Field

Operations

Unit Sector

Electricity generation

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Elements and Performance Criteria

ELEMENTS	PERFORMANCE CRITERIA
Elements describe the essential outcomes.	Performance criteria describe the performance needed to demonstrate achievement of the element.
1 Plan for plant operation	**1.1** Power generating safety issues are identified, in accordance with workplace procedures and Work, Health and Safety (WHS)/Occupational Health and Safety (OHS) legislation
	1.2 Work, power generation plant and resource requirements are identified, in accordance with workplace procedures, from relevant information and documentation
	1.3 Preoperational checks of power generation plant operations are carried out, in accordance with workplace procedures and site requirements
2 Operate generator and excitation system	**2.1** Generator and excitation system is operated, in accordance with workplace procedures and manufacturers' operating recommendations
	2.2 Synchronising requirements are assessed and evaluated, in accordance with workplace procedures to ensure generator and excitation system stability
	2.3 Generator and excitation system is monitored and observed, in accordance with workplace procedures, to detect deviations from normal operating conditions
	2.4 Corrective actions are taken to rectify generator and excitation system abnormalities, in accordance with manufacturers' recommendations and workplace procedures
3 Control generation of electrical energy	**3.1** Power generator output is adjusted, in accordance with workplace procedures, to meet electricity demand whilst observing operating requirements
	3.2 Reactive power generation and voltage regulation requirements are assessed and the generator and excitation system is controlled to achieve desired output, in accordance with workplace procedures
	3.3 Generator stabilities and operating limits are assessed and the generator and excitation system is controlled to maintain those limits, in accordance with workplace

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		procedures and manufacturers' recommendations
	3.4	Generator cooling systems and limits are monitored and assessed, and the excitation system is controlled to maintain those limits, in accordance with workplace procedures and manufacturers' recommendations
4 Coordinate generation control	**4.1**	Load sharing between multiple generators is controlled, in accordance with workplace procedures, to maintain optimum efficiency and power generating plant reliability
	4.2	Output of generators is adjusted to meet electricity demand whilst observing operating requirements, in accordance with workplace procedures
	4.3	Generator and excitation system and power generating plant key indicators are monitored and adjusted, in accordance with workplace procedures, to maintain limits and detect deviations from normal operating conditions
	4.4	Corrective actions are taken to rectify generator and excitation system abnormalities, in accordance with manufacturers' recommendations and workplace procedures
	4.5	Generator and excitation system integrity and continuity of supply are maintained, in accordance with workplace procedures
	4.6	Consultation with appropriate personnel is undertaken, in accordance with workplace procedures
	4.7	Generator and excitation system is operated at optimum efficiency, in accordance with workplace procedures
5 Monitor system and plant	**5.1**	Generator and excitation system or power generating plant to be monitored is physically identified, in accordance with workplace procedures
	5.2	Generator and excitation system or power generating plant is monitored, in accordance with workplace procedures, for normal operation or to detect deviations
	5.3	Corrective actions are taken, in accordance with workplace procedures
	5.4	Appropriate personnel are notified, in accordance with workplace procedures, when defects and abnormal

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		operating conditions are detected
6 Analyse system and plant faults	**6.1**	Causes of abnormal generator and excitation system operating conditions are identified, in accordance with workplace procedures, by analysing technical and operational information
	6.2	Corrective actions to rectify faults are determined, in accordance with workplace procedures
	6.3	Generator and excitation system or power generating plant integrity is maintained, in accordance with workplace procedures, through consultation with appropriate personnel and reference to technical and operational documentation
	6.4	Appropriate personnel, including specialists, are arranged for investigation of identified operational abnormalities, in accordance with workplace procedures
7 Complete documentation	**7.1**	Power generation plant problems, movements and status are reported, in accordance with workplace procedures
	7.2	Documentation is updated, in accordance with workplace procedures

Foundation Skills

Foundation skills essential to performance are explicit in the performance criteria of this unit of competency.

Range of Conditions

Range is restricted to essential operating conditions and any other variables essential to the work environment.

Non-essential conditions may be found in the Companion Volume Implementation Guide.

Unit Mapping Information

This unit replaces and is equivalent to UEPOPS515B Coordinate power generation.

Links

Companion Volume implementation guides are found in VETNet - https://vetnet.gov.au/Pages/TrainingDocs.aspx?q=1715b9fa-e7bd-441c-bb8d-cf22c9c825a8

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Assessment Requirements for UEPOPS515 Coordinate power generation

Modification History

Release 1. This is the first release of this unit of competency in the UEP Generation Training Package.

Performance Evidence

Evidence required to demonstrate competence in this unit must be relevant to and satisfy all the requirements of the elements, performance criteria and range of conditions on at least two separate occasions and includes:

- analysing generator and excitation system and power generation plant faults using data analysis techniques and tools
- applying Work, Health and Safety (WHS)/Occupational Health and Safety (OHS) requirements including:
  - emergency procedures
  - risk control measures
  - safe working practices
- communicating with personnel
- completing documentation using recording procedures
- controlling and coordinating power generation of electrical energy
- coordinating power generation control
- coordinating operation of equipment to maintain power generation plant integrity and continuity of supply including:
  - clarifying power generation plant status
  - determining appropriate corrective actions
  - maintaining power generator unit integrity
  - recognising abnormal plant operating conditions
- interpreting manufacturers' specifications and manuals
- interpreting remote indication of power generation plant status and condition
- monitoring generator and excitation system and power generation plant
- operating generator and excitation system
- planning for one operator isolated power generation plant operations

Knowledge Evidence

Evidence required to demonstrate competence in this unit must be relevant to and satisfy all the requirements of the elements, performance criteria and range of conditions and includes knowledge of:

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- analysis of system faults typical arrangements of power production plant
- coordination of power generation including one operator isolated power generation plant operations
- generator excitation and cooling systems, types and characteristics types
- identification of power generation plant status
- legislation, industry standards, codes of practice and regulations
- manufacturers' specifications and manuals
- operation of generator and excitation system
- power generation plant and equipment, its location and operating parameters
- power generation plant process control systems, system components and interactions
- WHS/OHS legislated requirements including:
  - emergency procedures
  - risk control measures
  - safe working practices
- workplace documentation
- workplace policies and procedures

Assessment Conditions

As a minimum, assessors must satisfy applicable regulatory requirements, which include requirements in the Standards for Registered Training Organisations current at the time of assessment.

As a minimum, assessment must satisfy applicable regulatory requirements, which include requirements in the Standards for Registered Training Organisations current at the time of assessment.

Assessment processes and techniques must be appropriate to the language, literacy and numeracy requirements of the work being performed and the needs of the candidate.

Assessment must occur in workplace operational situations. Where this is not appropriate, assessment must occur in simulated workplace operational situations that reflect workplace conditions.

Resources for assessment must include access to:

- a range of relevant exercises, case studies and/or other simulations
- relevant and appropriate materials, tools, equipment and personal protective equipment currently used in industry
- applicable documentation including workplace procedures, industry standards, equipment specifications, regulations, codes of practice and operation manuals.

Links

Companion Volume implementation guides are found in VETNet - https://vetnet.gov.au/Pages/TrainingDocs.aspx?q=1715b9fa-e7bd-441c-bb8d-cf22c9c825a8

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UEPOPS520 Evaluate cost estimations and initiate appropriate solutions

Modification History

Release 1. This is the first release of this unit of competency in the UEP Generation Training Package.

Application

This unit involves the skills and knowledge required to evaluate estimated costs for planned and forced power generation plant outages (either a single item or whole unit) and to initiate appropriate solutions.

An outage is when power generation plant and/or equipment is not available to perform its intended function. Forced outage is the shutdown of power generation plant, equipment or a power generation facility when a generating unit is unavailable to produce power due to an unexpected breakdown.

Competency in this unit requires the ability to evaluate work details, identify costs, develop solutions and complete documentation. Individuals will, in general, work under supervision, in a power generation facility as an operator with responsibility for maintenance budgets.

No licensing, legislative or certification requirements apply to this unit at the time of publication.

Note: Workplace practice

The application of the skills and knowledge described in this unit may require a licence or training permit to practice in the workplace where work is carried out on gas and electrical installations. Additional conditions may apply under state and territory legislative and regulatory licensing requirements.

Pre-requisite Unit

UEENEEC005B Estimate electrotechnology projects

Competency Field

Operations

Unit Sector

Electricity generation

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Elements and Performance Criteria

ELEMENTS	PERFORMANCE CRITERIA
Elements describe the essential outcomes.	Performance criteria describe the performance needed to demonstrate achievement of the element.
1 Evaluate work details	**1.1** Power generation plant outage work plan and methods are evaluated, in accordance with workplace procedures
	1.2 Time frames for power generation plant outage work is identified, in accordance with workplace procedures
	1.3 Details of materials, equipment, specialist services and contractual provisions are identified, in accordance with workplace procedures
	1.4 Specific disposal requirements are evaluated, in accordance with workplace procedures
2 Identify costs	**2.1** Costs associated with the planned and forced outages are evaluated, in accordance with workplace procedures
	2.2 Previous planned and forced outages are analysed, in accordance with workplace procedures, to determine problems
3 Develop solutions	**3.1** Potential solutions to limit time frame and budget over runs are identified, in accordance with workplace procedures
	3.2 Potential variations in planned and forced outages scope of work are identified, in accordance with workplace procedures, and solutions are developed
4 Complete documentation	**4.1** Evaluation report is produced, in accordance with workplace procedures
	4.2 Possible increases in budget are documented, in accordance with workplace procedures

Foundation Skills

Foundation skills essential to performance are explicit in the performance criteria of this unit of competency.

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Range of Conditions

Range is restricted to essential operating conditions and any other variables essential to the work environment.

Non-essential conditions may be found in the Companion Volume Implementation Guide.

Unit Mapping Information

This unit replaces and is equivalent to UEPOPS520A Evaluate cost estimations and initiate appropriate solutions.

Links

Companion Volume implementation guides are found in VETNet - https://vetnet.gov.au/Pages/TrainingDocs.aspx?q=1715b9fa-e7bd-441c-bb8d-cf22c9c825a8

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Assessment Requirements for UEPOPS520 Evaluate cost estimations and initiate appropriate solutions

Modification History

Release 1. This is the first release of this unit of competency in the UEP Generation Training Package.

Performance Evidence

Evidence required to demonstrate competence in this unit must be relevant to and satisfy all the requirements of the elements, performance criteria and range of conditions on at least two separate occasions and includes:

- applying Work, Health and Safety (WHS)/Occupational Health and Safety (OHS) requirements including:
  - emergency procedures
  - risk control measures
  - safe working practices
- communicating with key stakeholders
- completing documentation
- developing planned and forced outage cost solutions
- evaluating planned and forced outage details
- identifying planned and forced outage costs using data analysis
- implementing legislation, industry standards, codes of practice and regulations
- producing quotations and cost options
- recognising cause and consequences of potential costs using data analysis techniques and tools
- utilising costing and quoting techniques

Knowledge Evidence

Evidence required to demonstrate competence in this unit must be relevant to and satisfy all the requirements of the elements, performance criteria and range of conditions and includes knowledge of:

- costing and quotation techniques
- costing and quotation techniques
- data analysis
- legislation, industry standards, codes of practice and regulations
- planned and forced outages
- potential solutions for outage costs
- power generation plant and equipment, its location and operating parameters

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- typical arrangements of power production plant
- WHS/OHS legislated requirements including:
  - emergency procedures
  - risk control measures
  - safe working practices
- workplace documentation
- workplace policies and procedures

Assessment Conditions

As a minimum, assessors must satisfy applicable regulatory requirements, which include requirements in the Standards for Registered Training Organisations current at the time of assessment.

As a minimum, assessment must satisfy applicable regulatory requirements, which include requirements in the Standards for Registered Training Organisations current at the time of assessment.

Assessment processes and techniques must be appropriate to the language, literacy and numeracy requirements of the work being performed and the needs of the candidate.

Assessment must occur in workplace operational situations. Where this is not appropriate, assessment must occur in simulated workplace operational situations that reflect workplace conditions.

Resources for assessment must include access to:

- a range of relevant exercises, case studies and/or other simulations
- relevant and appropriate materials, tools, equipment and personal protective equipment currently used in industry
- applicable documentation including workplace procedures, industry standards, equipment specifications, regulations, codes of practice and operation manuals.

Links

Companion Volume implementation guides are found in VETNet - https://vetnet.gov.au/Pages/TrainingDocs.aspx?q=1715b9fa-e7bd-441c-bb8d-cf22c9c825a8

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UEPOPS523 Manage critical incidents

Modification History

Release 1. This is the first release of this unit of competency in the UEP Generation Training Package.

Application

This unit involves the skills and knowledge required to undertake the management of incidents of a critical nature that may impact the operational effectiveness of a power generation facility's plant or system. It may include endangering human life, damaging or destroying property or adversely impacting the environment.

A critical incident refers to an event that may result in a high level of risk, directly or indirectly, to the core operations of a power generation facility. The level of risk is determined using the risk management processes outlined in the power generation facility's Risk Management System.

Competency in this unit requires the ability to identify a crisis, implement contingency and critical incident plans, establish communications, manage critical incident documents and review critical incident response. Individuals will, in general, work as an operator with responsibility for risk management, in a power generation facility.

Power generation plant operators are typically trained and authorised to isolate, prepare plant and issue permits to work.

No licensing, legislative or certification requirements apply to this unit at the time of publication.

Note: Workplace practice

The application of the skills and knowledge described in this unit may require a licence or training permit to practice in the workplace where work is carried out on gas and electrical installations. Additional conditions may apply under state and territory legislative and regulatory licensing requirements.

Pre-requisite Unit

UEPOPS369 Respond to a critical incident

UEPOPS454 Coordinate response to critical incidents

Competency Field

Operations

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Unit Sector

Electricity generation

Elements and Performance Criteria

ELEMENTS	PERFORMANCE CRITERIA
Elements describe the essential outcomes.	Performance criteria describe the performance needed to demonstrate achievement of the element.
1 Identify critical incident and consequences	**1.1** Critical incident and probable implications are identified and analysed, in accordance with risk management system and workplace procedures
	1.2 Secondary threats from the critical incident are identified and monitored, in accordance with risk management system and workplace procedures
	1.3 Data related to critical incident is evaluated and managed to determine cause consequences and potential responses, in accordance with risk management system and workplace procedures
	1.4 Critical Incident Management team is activated and individual roles and responsibilities are identified and managed, in accordance with risk management system and workplace procedures
2 Implement contingency and critical incident plan	**2.1** Contingency and critical incident plans are implemented using risk management system documentation and workplace procedures
	2.2 Additional resources are identified, in accordance with risk management system and workplace procedures
	2.3 Alternate strategies to cater for crisis variations are managed in consultation with key stakeholders, in accordance with risk management system and workplace procedures
3 Establish communications	**3.1** Communication links with external authorities are established, in accordance with risk management system and workplace procedures, for coordination of resources
	3.2 Communication with key stakeholders is established to disseminate information, in accordance with risk management system and workplace procedures

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4 Supervise critical incident	**4.1** Critical incident response is managed, in accordance with risk management system, workplace procedures and site requirements
	4.2 Critical incident events and responses are prioritised, related to risk and the needs of stakeholders, in accordance risk management system and workplace procedures
	4.3 Personnel and key stakeholder actions are monitored and managed, in accordance with risk management system and workplace procedures
	4.4 Impact of secondary threats are managed, in accordance risk management system and workplace procedures
	4.5 Contingency and critical incident plans are actioned and managed, in accordance with risk management system policies and workplace procedures
	4.6 Additional resources are directed and managed, in accordance with risk management system and workplace procedures
	4.7 Restoration strategies are monitored, evaluated and adjusted, as required, in accordance risk management system and workplace procedures
5 Document and review critical incident response	**5.1** Equipment failure or problems are managed, in accordance with risk management system and workplace procedures
	5.2 Critical incident feedback from key stakeholders is analysed and managed, in accordance with risk management system and workplace procedures
	5.3 Critical incident report with alternative preventative measures are distributed to appropriate personnel, in accordance with risk management system and workplace procedures
	5.4 Improvements to critical incident management processes and procedures are managed, in accordance with risk management system and workplace procedures
	5.5 Alternative strategies are identified and analysed, and recommendations are communicated to appropriate personnel, in accordance with risk management system and workplace procedures

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Foundation Skills

Foundation skills essential to performance are explicit in the performance criteria of this unit of competency.

Range of Conditions

Range is restricted to essential operating conditions and any other variables essential to the work environment.

Non-essential conditions may be found in the Companion Volume Implementation Guide.

Unit Mapping Information

This unit replaces and is equivalent to UEPOPS523A Manage critical incidents.

Links

Companion Volume implementation guides are found in VETNet - https://vetnet.gov.au/Pages/TrainingDocs.aspx?q=1715b9fa-e7bd-441c-bb8d-cf22c9c825a8

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Assessment Requirements for UEPOPS523 Manage critical incidents

Modification History

Release 1. This is the first release of this unit of competency in the UEP Generation Training Package.

Performance Evidence

Evidence required to demonstrate competence in this unit must be relevant to and satisfy all the requirements of the elements, performance criteria and range of conditions on at least two separate occasions and includes:

- applying Work, Health and Safety (WHS)/Occupational Health and Safety (OHS) requirements including:
  - emergency procedures
  - risk control measures
  - safe working practices
- communicating and liaising with key stakeholders
- coordinating operation of system network
- determining contingency and critical incident plans
- documenting and reviewing critical incident and response
- identifying critical incident and potential consequences
- implementing contingency and critical incident plans
- implementing legislation, industry standards, codes of practice and regulations
- instigating communications including recording procedures
- managing critical incident
- recognising plant status including abnormal system operating conditions using data analysis techniques and tools
- supervising emergency situations including directing and managing personnel
- undertaking critical incident planning using diagnostic techniques
- using critical incident policies and procedures
- utilising Risk Management System
- working with restoration strategies

Knowledge Evidence

Evidence required to demonstrate competence in this unit must be relevant to and satisfy all the requirements of the elements, performance criteria and range of conditions and includes knowledge of:

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- contingency and critical incident plans
- critical incident planning and management
- external critical incident authorities
- plant status including system network characteristics
- restoration strategies
- Risk Management Systems
- risk mitigation processes
- typical arrangements of power production plant including plant and equipment, its location and operating parameters
- WHS/OHS legislated requirements including:
  - emergency procedures
  - risk control measures
  - safe working practices
- workplace documentation
- workplace policies and procedures legislation, industry standards, codes of practice and regulations

Assessment Conditions

As a minimum, assessors must satisfy applicable regulatory requirements, which include requirements in the Standards for Registered Training Organisations current at the time of assessment.

As a minimum, assessment must satisfy applicable regulatory requirements, which include requirements in the Standards for Registered Training Organisations current at the time of assessment.

Assessment processes and techniques must be appropriate to the language, literacy and numeracy requirements of the work being performed and the needs of the candidate.

Assessment must occur in workplace operational situations. Where this is not appropriate, assessment must occur in simulated workplace operational situations that reflect workplace conditions.

Resources for assessment must include access to:

- a range of relevant exercises, case studies and/or other simulations
- relevant and appropriate materials, tools, equipment and personal protective equipment currently used in industry
- applicable documentation including workplace procedures, industry standards, equipment specifications, regulations, codes of practice and operation manuals.

Links

Companion Volume implementation guides are found in VETNet - https://vetnet.gov.au/Pages/TrainingDocs.aspx?q=1715b9fa-e7bd-441c-bb8d-cf22c9c825a8

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UEPOPS524 Evaluate scheduling of generation plant

Modification History

Release 1. This is the first release of this unit of competency in the UEP Generation Training Package.

Application

This unit involves the skills and knowledge required to undertake the evaluation of a power generation plant schedule to meet forecast demand.

Scheduling is the process of arranging and optimising the use of generating plant and personnel in a power generation facility. Scheduling can have a major impact on the productivity and costs of a power generation facility.

Competency in this unit requires the ability to analyse load profile, evaluate power generation unit availability and capability, evaluate power generation unit schedule and complete documentation. Individuals will, in general, work as an operator with responsibility for scheduling in a power generation facility.

Power generation plant operators are typically trained and authorised to isolate, prepare plant and issue permits to work.

No licensing, legislative or certification requirements apply to this unit at the time of publication.

Note: Workplace practice

The application of the skills and knowledge described in this unit may require a licence or training permit to practice in the workplace where work is carried out on gas and electrical installations. Additional conditions may apply under state and territory legislative and regulatory licensing requirements.

Pre-requisite Unit

UEPOPS422 Schedule generation

Competency Field

Operations

Unit Sector

Electricity generation

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Elements and Performance Criteria

ELEMENTS	PERFORMANCE CRITERIA
Elements describe the essential outcomes.	Performance criteria describe the performance needed to demonstrate achievement of the element.
1 Analyse load profile	**1.1** Information on variables which have the potential to affect power generation demand and load are analysed, in accordance with workplace procedures
	1.2 Power generation forecasts are produced, in accordance with workplace procedures
	1.3 Power generation forecasts are evaluated against real time trends, and adjustments are made, in accordance with workplace procedures
2 Evaluate unit availability and capability	**2.1** Power generation unit status is analysed, in accordance with workplace procedures, to maintain the integrity of scheduling plans
	2.2 Information on power generation unit status is processed and recorded, in accordance with workplace procedures, to enable the identification of problems
	2.3 Relationships are maintained with remote or independent power generators, in accordance with workplace procedures
3 Evaluate generation unit schedules	**3.1** Base load generation schedules are analysed, in accordance with workplace procedures, and in line with contractual obligations
	3.2 Peak load generation schedules are analysed to meet power generation system demand, in accordance with workplace procedures, to maintain adequate spinning reserve capability
	3.3 Schedule is evaluated to confirm power generation units are operating, in accordance with workplace procedures and fuel strategies framework
	3.4 Megawatts and megavar spinning reserve criteria are continuously evaluated, in accordance with workplace procedures
	3.5 Power generation system security criteria are analysed continuously, in accordance with workplace procedures

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	3.6	Quality of supply is analysed continuously, in accordance with workplace procedures and legislative requirements
	3.7	Power generation plant maintenance commitments are analysed, in accordance with workplace procedures, when setting priorities for committing power generation units
	3.8	Schedule is produced with sufficient lead time to allow power generation plant movements to occur, in accordance with workplace procedures
	3.9	Power generation plant problems are assessed for impact on unit commitment and scheduling requirements, in accordance with workplace procedures
	3.10	Power generation plant testing is incorporated into priorities for committing power generation units, in accordance with workplace procedures
4 Complete documentation	**4.1**	Scheduling information is recorded, in accordance with workplace procedures
	4.2	Key stakeholders are informed of scheduling evaluation outcomes, in accordance with workplace procedures

Foundation Skills

Foundation skills essential to performance are explicit in the performance criteria of this unit of competency.

Range of Conditions

Range is restricted to essential operating conditions and any other variables essential to the work environment.

Non-essential conditions may be found in the Companion Volume Implementation Guide.

Unit Mapping Information

This unit replaces and is equivalent to UEPOPS524A Evaluate the scheduling of generation.

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Links

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Assessment Requirements for UEPOPS524 Evaluate scheduling of generation plant

Modification History

Release 1. This is the first release of this unit of competency in the UEP Generation Training Package.

Performance Evidence

Evidence required to demonstrate competence in this unit must be relevant to and satisfy all the requirements of the elements, performance criteria and range of conditions on at least two separate occasions and includes:

- analysing and forecasting load profile
- applying Work, Health and Safety (WHS)/Occupational Health and Safety (OHS) requirements including:
  - emergency procedures and techniques
  - risk control measures
  - safe working practices and procedures
- assessing power generation unit availability and capability
- communicating with stakeholders
- completing documentation using recording procedures
- evaluating power generation unit schedules
- evaluating scheduling of power generating units for optimum efficiency using data analysis techniques and tools
- identifying power generation unit status
- implementing legislation, industry standards, codes of practice and regulations
- preparing and implementing power generation schedules
- scheduling power generation plant to meet demand
- using manufacturers' specifications and manuals
- utilising fuel strategies

Knowledge Evidence

Evidence required to demonstrate competence in this unit must be relevant to and satisfy all the requirements of the elements, performance criteria and range of conditions and includes knowledge of:

- evaluation techniques and tools
- framework for fuel strategies
- identification of power generation unit status
- legislation, industry standards, codes of practice and regulations

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- load profile forecasts
- manufacturers' specifications and manuals
- operation and load characteristics of power generation plant
- power generation plant and equipment, its location and operating parameters
- power generation schedule implementation
- power generation schedules including peak load generation schedules
- stakeholder liaison
- typical arrangements of power production plant
- WHS/OHS legislated requirements including:
  - emergency procedures and techniques
  - risk control measures
  - safe working practices and procedures
- workplace documentation
- workplace policies and procedures

Assessment Conditions

As a minimum, assessors must satisfy applicable regulatory requirements, which include requirements in the Standards for Registered Training Organisations current at the time of assessment.

As a minimum, assessment must satisfy applicable regulatory requirements, which include requirements in the Standards for Registered Training Organisations current at the time of assessment.

Assessment processes and techniques must be appropriate to the language, literacy and numeracy requirements of the work being performed and the needs of the candidate.

Assessment must occur in workplace operational situations. Where this is not appropriate, assessment must occur in simulated workplace operational situations that reflect workplace conditions.

Resources for assessment must include access to:

- a range of relevant exercises, case studies and/or other simulations
- relevant and appropriate materials, tools, equipment and personal protective equipment currently used in industry
- applicable documentation including workplace procedures, industry standards, equipment specifications, regulations, codes of practice and operation manuals.

Links

Companion Volume implementation guides are found in VETNet - https://vetnet.gov.au/Pages/TrainingDocs.aspx?q=1715b9fa-e7bd-441c-bb8d-cf22c9c825a8

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UEPOPS525 Coordinate and direct switching program

Modification History

Release 1. This is the first release of this unit of competency in the UEP Generation Training Package.

Application

This unit involves the skills and knowledge required to coordinate and direct resources for a switching program.

An electrical switch can alternate a load between two sources either manually or automatically when sensors detect one of the sources has lost or gained power. A switch is typically installed where the backup generator is located so that the generator can be used to provide temporary electrical power, as required.

Competency in this unit requires the ability to prepare for a switching program, coordinate and direct a switching program, maintain dynamic integrity of power generation system and complete all documentation. Individuals will, in general, work as a switching program coordinator, in a power generation facility.

Power generation plant operators are typically trained and authorised to isolate, prepare plant and issue permits to work.

No licensing, legislative or certification requirements apply to this unit at the time of publication.

Note: Workplace practice

The application of the skills and knowledge described in this unit may require a licence or training permit to practice in the workplace where work is carried out on gas and electrical installations. Additional conditions may apply under state and territory legislative and regulatory licensing requirements.

Pre-requisite Unit

UEPOPS456 Perform switching to a switching program

Competency Field

Operations

Unit Sector

Electricity generation

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Elements and Performance Criteria

ELEMENTS	PERFORMANCE CRITERIA
Elements describe the essential outcomes.	Performance criteria describe the performance needed to demonstrate achievement of the element.
1 Prepare for switching program	**1.1** Qualifications and authorisations of personnel performing switching operations are established, in accordance with workplace procedures
	1.2 Work, Health and Safety (WHS)/Occupational Health and Safety (OHS) regulations, industry standards, legislative requirements codes of practice and environmental obligations are identified, applied and monitored
	1.3 Contingency plan is evaluated and discussed with key stakeholders, in accordance with workplace procedures, and any amendments made are relayed to all appropriate personnel
	1.4 Permit and access requirements are established prior to switching program commencement, in accordance with workplace procedures
	1.5 Documentation is distributed, in accordance with workplace procedures, to relevant personnel prior to switching program commencement
2 Direct switching program	**2.1** Personnel are advised of switching programme and directed to locations, in accordance with workplace procedures
	2.2 Communication is established with key stakeholders and personnel, in accordance with workplace procedures, and is maintained throughout duration of switching program
	2.3 Network system schematic diagram, or equivalent, is updated, in accordance with workplace procedures, as switching program proceeds
	2.4 Access to power generation plant is controlled, in accordance with workplace policies and procedures
	2.5 Work groups are coordinated and directed throughout switching programme, in accordance with workplace procedures

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	2.6	Permits issued are monitored and recorded, in accordance with workplace procedures
	2.7	Switching program is controlled, in accordance with workplace procedures, to ensure outage coincides with planned timetable
3 Maintain dynamic integrity of system	**3.1**	Switching program steps are verified before and after each operation, in accordance with workplace procedures
	3.2	Switching program steps are recorded, in accordance with workplace procedures, upon successful completion of each operation
	3.3	Network system conditions or stability is constantly monitored, in accordance with workplace procedures
	3.4	Alternative switching program steps are quickly and accurately developed, in accordance with workplace procedures, if unexpected problems occur
4 Complete documentation	**4.1**	Equipment problems and status are reported, in accordance with workplace procedures
	4.2	Documentation is updated, in accordance with workplace procedures

Foundation Skills

Foundation skills essential to performance are explicit in the performance criteria of this unit of competency.

Range of Conditions

Range is restricted to essential operating conditions and any other variables essential to the work environment.

Non-essential conditions may be found in the Companion Volume Implementation Guide.

Unit Mapping Information

This unit replaces and is equivalent to UEPOPS525A Coordinate and direct switching program.

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Links

Companion Volume implementation guides are found in VETNet - https://vetnet.gov.au/Pages/TrainingDocs.aspx?q=1715b9fa-e7bd-441c-bb8d-cf22c9c825a8

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Assessment Requirements for UEPOPS525 Coordinate and direct switching program

Modification History

Release 1. This is the first release of this unit of competency in the UEP Generation Training Package.

Performance Evidence

Evidence required to demonstrate competence in this unit must be relevant to and satisfy all the requirements of the elements, performance criteria and range of conditions on at least two separate occasions and includes:

- applying Work, Health and Safety (WHS)/Occupational Health and Safety (OHS) requirements including:
  - emergency procedures
  - risk control measures
  - safe working practices
- communicating with personnel
- completing documentation
- coordinating and directing switching programs
- identifying power generation plant status including:
  - monitoring network system integrity and stability
  - analysing system operational information
  - recognising abnormal power generating plant and/or network system operating conditions
  - determining corrective actions
- implementing legislation, industry standards, codes of practice and regulations
- interpreting power generation plant drawings and network system diagrams
- liaising with stakeholders
- maintaining dynamic integrity of power generation system
- preparing for switching program
- using manufacturers' specifications and manuals
- utilising contingency plans
- working with permit to work system

Knowledge Evidence

Evidence required to demonstrate competence in this unit must be relevant to and satisfy all the requirements of the elements, performance criteria and range of conditions and includes knowledge of:

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- contingency plans
- coordination and direction of switching programs
- legislation, industry standards, codes of practice and regulations
- permit to work system
- plant drawings, network system diagrams, manufacturers' specifications and manuals
- power generation network system diagrams
- power generation system integrity and stability monitoring processes and procedures
- preparations for switching programs
- stakeholder liaison
- switching operation processes and procedures
- typical arrangements of power production plant including:
  - corrective actions
  - power generation plant and equipment, its location and operating parameters
  - power generation plant status
  - switchgear types and characteristics
  - systems network
- WHS/OHS legislated requirements including:
  - emergency procedures
  - risk control measures
  - safe working practices
- workplace documentation
- workplace policies and procedures

Assessment Conditions

As a minimum, assessors must satisfy applicable regulatory requirements, which include requirements in the Standards for Registered Training Organisations current at the time of assessment.

As a minimum, assessment must satisfy applicable regulatory requirements, which include requirements in the Standards for Registered Training Organisations current at the time of assessment.

Assessment processes and techniques must be appropriate to the language, literacy and numeracy requirements of the work being performed and the needs of the candidate.

Assessment must occur in workplace operational situations. Where this is not appropriate, assessment must occur in simulated workplace operational situations that reflect workplace conditions.

Resources for assessment must include access to:

- a range of relevant exercises, case studies and/or other simulations
- relevant and appropriate materials, tools, equipment and personal protective equipment currently used in industry
- applicable documentation including workplace procedures, industry standards, equipment

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specifications, regulations, codes of practice and operation manuals.

Links

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UEPOPS526 Coordinate electrical energy production

Modification History

Release 1. This is the first release of this unit of competency in the UEP Generation Training Package.

Application

This unit involves the skills and knowledge required to coordinate the safe and effective management of energy production to meet demand on an electricity generating unit.

Power utilities match demand and supply through adjusting the production rate of their power generating facilities. This is achieved by taking generating units online and offline or through importing power from other utilities.

Competency in this unit requires the ability to coordinate unit operations, monitor network system and power generating plant, analyse network system and power generating plant faults and complete all documentation. Individuals will, in general, work as an operator with responsibility for coordinating electrical energy production, in a power generation facility.

Power generation plant operators are typically trained and authorised to isolate, prepare plant and issue permits to work.

No licensing, legislative or certification requirements apply to this unit at the time of publication.

Note: Workplace practice

The application of the skills and knowledge described in this unit may require a licence or training permit to practice in the workplace where work is carried out on gas and electrical installations. Additional conditions may apply under state and territory legislative and regulatory licensing requirements.

Pre-requisite Unit

UEPOPS457 Control electrical energy production

Competency Field

Operations

Unit Sector

Electricity generation

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Elements and Performance Criteria

ELEMENTS	PERFORMANCE CRITERIA
Elements describe the essential outcomes.	Performance criteria describe the performance needed to demonstrate achievement of the element.
1 Coordinate unit operations	**1.1** Electricity generating unit is operated, in accordance with workplace procedures, industry standards and Work, Health and Safety (WHS)/Occupational Health and Safety (OHS) regulations to meet demand requirements whilst observing power generating plant limitations
	1.2 Electricity generating unit is monitored and observed, in accordance with workplace procedures, to detect deviations from normal operating conditions
	1.3 Causes of abnormal operating conditions in electricity generating unit is identified, in accordance with workplace procedures, by analysing technical and operational information
	1.4 Corrective actions are taken to rectify electricity generating unit abnormalities, in accordance with workplace procedures and site requirements
	1.5 Electricity generating unit's integrity personnel safety and continuity of supply are maintained, in accordance with workplace procedures
	1.6. Consultation with appropriate personnel is undertaken, as required, in accordance with workplace procedures
	1.7 Electricity generating unit is operated at optimum efficiency, in accordance with workplace procedures
2 Monitoring unit and plant	**2.1** Electricity generating unit and power generating plant to be monitored is physically identified, in accordance with workplace procedures
	2.2 Electricity generating unit and power generating plant is monitored, in accordance with workplace procedures, for normal operation or to detect deviations
	2.3 Corrective action is taken, in accordance with workplace procedures
	2.4 Appropriate personnel are notified, in accordance with workplace procedures, when defects and abnormal

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		operating conditions in electricity generating unit and power generating plant are detected
3 Test unit and plant operation	**3.1**	Operational tests are performed, in accordance with workplace procedures
	3.2	Electricity generating unit and power generating plant is observed, in accordance with workplace procedures, for correct operational response
	3.3	Corrective action is taken, in accordance with workplace procedures, when response does not meet with documentation, electricity generating unit and power generating plant integrity or personnel safety requirements
	3.4	Electricity generating unit and power generating plant is returned to operational status, in accordance with workplace procedures, upon completion of testing
4 Analyse unit and plant faults	**4.1**	Causes of abnormal electricity generating unit operating conditions are identified, in accordance with workplace procedures, by analysing technical and operational information
	4.2	Corrective actions to rectify faults are determined, in accordance with workplace procedures
	4.3	Electricity generating unit and power generating plant integrity and personnel safety are maintained, in accordance with workplace procedures, through consultation with personnel and technical and operational documentation
	4.4	Appropriate personnel, including specialists, are arranged for investigation of identified operational abnormalities, in accordance with workplace procedures
5 Complete documentation	**5.1**	Electricity generating unit and power generation plant problems, movements and status are reported, in accordance with workplace procedures
	5.2	Documentation is updated, in accordance with workplace procedures

Foundation Skills

Foundation skills essential to performance are explicit in the performance criteria of this unit of

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competency.

Range of Conditions

Range is restricted to essential operating conditions and any other variables essential to the work environment.

Non-essential conditions may be found in the Companion Volume Implementation Guide.

Unit Mapping Information

This unit replaces and is equivalent to UEPOPS526A Coordinate electrical energy production.

Links

Companion Volume implementation guides are found in VETNet - https://vetnet.gov.au/Pages/TrainingDocs.aspx?q=1715b9fa-e7bd-441c-bb8d-cf22c9c825a8

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Assessment Requirements for UEPOPS526 Coordinate electrical energy production

Modification History

Release 1. This is the first release of this unit of competency in the UEP Generation Training Package.

Performance Evidence

Evidence required to demonstrate competence in this unit must be relevant to and satisfy all the requirements of the elements, performance criteria and range of conditions on at least two separate occasions and includes:

- analysing electricity generating unit and generating power plant faults using data
- analysis techniques and tools
- applying Work, Health and Safety (WHS)/Occupational Health and Safety (OHS) requirements including:
  - emergency procedures
  - risk control measures
  - safe working practices
- communicating with personnel
- completing documentation
- coordinating electricity generating unit operations
- coordinating power generation including:
  - controlling electricity generating unit systems energy generation
  - maintaining generator unit integrity
  - monitoring power generating plant and equipment operations
  - preparing power generation plant and equipment for operation
  - recognising power generation plant status
- identifying and responding to abnormal electricity generating unit system and power generating plant operating conditions
- implementing legislation, industry standards, codes of practice and regulations
- interpreting manufacturers' specifications and manuals
- monitoring electricity generating unit and power generating plant
- testing electricity generating unit and power generating plant operations using diagnostic and testing techniques

Knowledge Evidence

Evidence required to demonstrate competence in this unit must be relevant to and satisfy all the requirements of the elements, performance criteria and range of conditions and includes

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knowledge of:

- analysis of electricity generating unit and power generating plant faults
- control electricity generating unit energy generation
- coordination of electricity generating unit operations
- electricity generating unit and power generating plant components and interactions
- generator and electricity generating unit stability
- legislation, industry standards, codes of practice and regulations
- manufacturers' specifications and manuals
- monitor electricity generating unit and power generating plant operation
- power generating plant and equipment, its location and operating parameters
- typical arrangements of power production plant
- WHS/OHS legislated requirements including:
  - emergency procedures
  - risk control measures
  - safe working practices
- workplace documentation
- workplace policies and procedures

Assessment Conditions

As a minimum, assessors must satisfy applicable regulatory requirements, which include requirements in the Standards for Registered Training Organisations current at the time of assessment.

As a minimum, assessment must satisfy applicable regulatory requirements, which include requirements in the Standards for Registered Training Organisations current at the time of assessment.

Assessment processes and techniques must be appropriate to the language, literacy and numeracy requirements of the work being performed and the needs of the candidate.

Assessment must occur in workplace operational situations. Where this is not appropriate, assessment must occur in simulated workplace operational situations that reflect workplace conditions.

Resources for assessment must include access to:

- a range of relevant exercises, case studies and/or other simulations
- relevant and appropriate materials, tools, equipment and personal protective equipment currently used in industry
- applicable documentation including workplace procedures, industry standards, equipment specifications, regulations, codes of practice and operation manuals.

Links

Companion Volume implementation guides are found in VETNet - https://vetnet.gov.au/Pages/TrainingDocs.aspx?q=1715b9fa-e7bd-441c-bb8d-cf22c9c825a8

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UEPOPS527 Manage first response team

Modification History

Release 2. This is the second release of this unit in the Electricity Supply Industry - Generation Sector Training Package. The following modification has been made:

- UEPOPS210 Conduct first response within a workplace team deleted due to zero enrolment.

Release 1. This is the first release of this unit of competency in the UEP Generation Training Package.

Application

This unit involves the skills and knowledge required to manage the operation of a first response team. It covers the development, implementation and review of the procedures for the operation of a first response team.

A first response team includes trained personnel who prepare for and respond to an emergency incident that poses an immediate risk in a power generation facility such as that caused through natural disaster, fire, hazardous spills or other dangerous events. First response teams must comply with federal, state and local government laws and regulations for the management of emergency incidents.

Competency in this unit requires the ability to plan for operation of first response team, manage operation of first response team and report outcomes of the emergency response. Individuals will, in general, work as an operator with responsibility for risk management, in a power generation facility.

Power generation plant operators are typically trained and authorised to isolate, prepare plant and issue permits to work.

No licensing, legislative or certification requirements apply to this unit at the time of publication.

Note: Workplace practice

The application of the skills and knowledge described in this unit may require a licence or training permit to practice in the workplace where work is carried out on gas and electrical installations. Additional conditions may apply under state and territory legislative and regulatory licensing requirements.

Pre-requisite Unit

UEPOPS404 Coordinate first response team operation

Competency Field

Operations

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Unit Sector

Electricity generation

Elements and Performance Criteria

ELEMENTS	PERFORMANCE CRITERIA
Elements describe the essential outcomes.	Performance criteria describe the performance needed to demonstrate achievement of the element.
1 Plan for operation of first response team	**1.1** Purpose of first response team is identified and clarified, in accordance with emergency response plan and risk management system
	1.2 Roles and responsibilities of external emergency services personnel are clarified and managed, in accordance with emergency response plan and risk management system
	1.3 First response team members are identified and assigned duties and responsibilities, in accordance with emergency response plan and risk management system
	1.4 Directions or advice is provided to emergency service personnel and first response team members after site inspection, in accordance with emergency response plan and Risk Management System
2 Manage operation of first response team	**2.1** Emergency incidents are investigated, assessed and evaluated to minimise hazards and control risks, in accordance with emergency response plan and risk management system
	2.2 Emergency incident investigation results and recommendations are documented and managed, in accordance with emergency response plan and risk management system procedures
	2.3 Guidance is provided to emergency services, in accordance with response plan and risk management system procedures
	2.4 First response team materials, equipment and resources required for to the emergency incidents are obtained and managed, in accordance with emergency response plan and risk management system procedures

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	2.5	Debriefing is conducted and findings are responded to and managed, in accordance with emergency response plan and risk management system procedures
3 Report outcomes of emergency response	**3.1**	Improvements to first response team emergency procedures are identified and managed with appropriate personnel, in accordance with emergency response plan and risk management system procedures
	3.2	Results of debriefing are reported, in accordance with emergency response plan and risk management system procedures
	3.3	Improvements to incident response procedures are implemented and managed, in accordance with emergency response plan and risk management system procedures

Foundation Skills

Foundation skills essential to performance are explicit in the performance criteria of this unit of competency.

Range of Conditions

Range is restricted to essential operating conditions and any other variables essential to the work environment.

Non-essential conditions may be found in the Companion Volume Implementation Guide.

Unit Mapping Information

This unit replaces and is equivalent to UEPOPS527A Manage first response team.

Links

Companion Volume implementation guides are found in VETNet - https://vetnet.gov.au/Pages/TrainingDocs.aspx?q=1715b9fa-e7bd-441c-bb8d-cf22c9c825a8

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Assessment Requirements for UEPOPS527 Manage first response team

Modification History

Release 2. This is the second release of this unit in the Electricity Supply Industry - Generation Sector Training Package. The following modification has been made:

- UEPOPS210 Conduct first response within a workplace team deleted due to zero enrolment.

Release 1. This is the first release of this unit of competency in the UEP Generation Training Package.

Performance Evidence

Evidence required to demonstrate competence in this unit must be relevant to and satisfy all the requirements of the elements, performance criteria and range of conditions on at least two separate occasions and includes:

- applying Work, Health and Safety (WHS)/Occupational Health and Safety (OHS) requirements including:
  - emergency procedures
  - risk control measures
  - safe working practices
- communicating with the personnel and other organisations and/or agencies following an emergency
- employing Risk Management System
- identifying hazards
- identifying potential hazards
- implementing legislation, industry standards, codes of practice and regulations
- managing first response team's emergency plant and/or equipment for operation
- managing team's response to an emergency using emergency procedures and techniques
- planning and managing operation of first response team
- reporting outcomes of emergency response
- utilising emergency response plans

Knowledge Evidence

Evidence required to demonstrate competence in this unit must be relevant to and satisfy all the requirements of the elements, performance criteria and range of conditions and includes knowledge of:

- communication techniques including stakeholder management
- emergency response plans

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- equipment appropriate to emergency tasks including operation and maintenance of
- legislation, industry standards, codes of practice and regulations
- management procedures of first response team in an emergency
- potential hazards
- power generation plant and equipment, its location and operating parameters
- power generation plant status
- Risk Management Systems
- roles and responsibilities of emergency services
- roles of first response team members
- typical arrangements of power production plant
- WHS/OHS legislated requirements including:
  - emergency procedures
  - risk control measures
  - safe working practices
- workplace documentation
- workplace policies and procedures

Assessment Conditions

As a minimum, assessors must satisfy applicable regulatory requirements, which include requirements in the Standards for Registered Training Organisations current at the time of assessment.

As a minimum, assessment must satisfy applicable regulatory requirements, which include requirements in the Standards for Registered Training Organisations current at the time of assessment.

Assessment processes and techniques must be appropriate to the language, literacy and numeracy requirements of the work being performed and the needs of the candidate.

Assessment must occur in workplace operational situations. Where this is not appropriate, assessment must occur in simulated workplace operational situations that reflect workplace conditions.

Resources for assessment must include access to:

- a range of relevant exercises, case studies and/or other simulations
- relevant and appropriate materials, tools, equipment and personal protective equipment currently used in industry
- applicable documentation including workplace procedures, industry standards, equipment specifications, regulations, codes of practice and operation manuals.

Links

Companion Volume implementation guides are found in VETNet - https://vetnet.gov.au/Pages/TrainingDocs.aspx?q=1715b9fa-e7bd-441c-bb8d-cf22c9c825a8

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UEPOPS528 Manage environmental management systems

Modification History

Release 1. This is the first release of this unit of competency in the UEP Generation Training Package.

Application

This unit involves the skills and knowledge required to manage the environmental management strategy of the power generation facility. It involves the implementation of policies and procedures related to environmental legislation and regulations that impact the power generation industry.

Environmental legislation is a collection of laws and regulations aimed at protecting the environment from harmful actions. Federal, state and local governments jointly administer environmental protection laws in Australia.

Competency in this unit requires the ability to plan, implement, manage and monitor environmental management strategies. Individuals will, in general, work as an operator with responsibility for environmental management systems, in a power generation facility.

No licensing, legislative or certification requirements apply to this unit at the time of publication.

Note: Workplace practice

The application of the skills and knowledge described in this unit may require a licence or training permit to practice in the workplace where work is carried out on gas and electrical installations. Additional conditions may apply under state and territory legislative and regulatory licensing requirements.

Pre-requisite Unit

No prerequisites are required for this unit.

Competency Field

Operations

Unit Sector

Electricity generation

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Elements and Performance Criteria

ELEMENTS	PERFORMANCE CRITERIA
Elements describe the essential outcomes.	Performance criteria describe the performance needed to demonstrate achievement of the element.
1 Plan environmental management strategies	**1.1** Environmental management system plan and strategies are identified and clarified with all stakeholders including external organisations
	1.2 Environmental management system activities and operation is identified and investigated to ensure that hazard minimisation strategies are developed and implemented
	1.3 Environmental management system strategies for identified problems are developed and prioritised for implementation
	1.4 Timelines, schedules and targets are established to ensure environmental management system objectives are managed
	1.5 Financial resources, personnel, physical facilities and equipment are procured and managed to achieve environmental management system performance outcomes
2 Manage environmental management strategies	**2.1** Environmental management system strategies are documented, assessed and evaluated to control risks
	2.2 Results and recommendations relating to environmental management system are documented and confirmed with stakeholders, in accordance with environmental management system plan
	2.3 Environmental management system and strategies are promoted to all stakeholders
3 Monitor environmental management strategies	**3.1** Data is collected and managed to provide accurate measures of performance, in accordance with Environmental management system plan
	3.2 Statistical comparisons between environmental management system objectives and performance are managed and reported, in accordance with environmental management system plan

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3.3 Feedback from stakeholders is evaluated and managed to determine changes to environmental management system plan and strategies

3.4 Changes to implemented strategies are recommended and managed, in accordance with environmental management system plan

Foundation Skills

Foundation skills essential to performance are explicit in the performance criteria of this unit of competency.

Range of Conditions

Range is restricted to essential operating conditions and any other variables essential to the work environment.

Non-essential conditions may be found in the Companion Volume Implementation Guide.

Unit Mapping Information

This unit replaces and is equivalent to UEPOPS528A Manage environmental management systems.

Links

Companion Volume implementation guides are found in VETNet - https://vetnet.gov.au/Pages/TrainingDocs.aspx?q=1715b9fa-e7bd-441c-bb8d-cf22c9c825a8

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Assessment Requirements for UEPOPS528 Manage environmental management systems

Modification History

Release 1. This is the first release of this unit of competency in the UEP Generation Training Package.

Performance Evidence

Evidence required to demonstrate competence in this unit must be relevant to and satisfy all the requirements of the elements, performance criteria and range of conditions on at least two separate occasions and includes:

- applying Work, Health and Safety (WHS)/Occupational Health and Safety (OHS) requirements including:
  - emergency procedures
  - risk control measures
  - safe working practices
- carrying out environmental planning and strategy development
- communicating with stakeholders
- identifying sources of pollution and minimisation procedures
- implementing legislation, industry standards, codes of practice and regulations
- managing resources
- managing risk management control measures
- monitoring and reviewing environmental strategies
- monitoring environmental management strategies and procedures
- producing and managing environmental management strategies
- recognising and managing potential environmental hazards and issues including
- recommending environmental management system strategy change
- researching and producing environmental reports using data analysis techniques and tools

Knowledge Evidence

Evidence required to demonstrate competence in this unit must be relevant to and satisfy all the requirements of the elements, performance criteria and range of conditions and includes knowledge of:

- environmental management system planning and strategy development
- environmental planning and/or management techniques and tools
- identifying and responding to environmental issues and change
- legislation, industry standards, codes of practice and regulations

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- potential impacts of environmental hazards including pollution
- power generation plant and equipment, its location and operating parameters
- resource usage
- risk management planning, techniques and tools
- stakeholder liaison
- typical arrangements of power production plant
- WHS/OHS legislated requirements including:
  - emergency strategies
  - risk control measures
  - safe working practices
- workplace documentation
- workplace policies and procedures

Assessment Conditions

As a minimum, assessors must satisfy applicable regulatory requirements, which include requirements in the Standards for Registered Training Organisations current at the time of assessment.

As a minimum, assessment must satisfy applicable regulatory requirements, which include requirements in the Standards for Registered Training Organisations current at the time of assessment.

Assessment processes and techniques must be appropriate to the language, literacy and numeracy requirements of the work being performed and the needs of the candidate.

Assessment must occur in workplace operational situations. Where this is not appropriate, assessment must occur in simulated workplace operational situations that reflect workplace conditions.

Resources for assessment must include access to:

- a range of relevant exercises, case studies and/or other simulations
- relevant and appropriate materials, tools, equipment and personal protective equipment currently used in industry
- applicable documentation including workplace procedures, industry standards, equipment specifications, regulations, codes of practice and operation manuals.

Links

Companion Volume implementation guides are found in VETNet - https://vetnet.gov.au/Pages/TrainingDocs.aspx?q=1715b9fa-e7bd-441c-bb8d-cf22c9c825a8

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UEPOPS529 Manage operational strategies for power production

Modification History

Release 1. This is the first release of this unit of competency in the UEP Generation Training Package.

Application

This unit involves the skills and knowledge required to manage operational strategies in achieving the short and long term goals of a power generation facility's production plant.

An operational plan of action describes how a power generation facility will employ their resources in producing power. Operational strategies are the methods used to reach objectives and performance targets related to resources, personnel and the work processes outlined in the operational plan.

Competency in this unit requires the ability to identify long and short term strategies, implement and manage strategies and report outcomes of strategies. Individuals will, in general, work as an operator with responsibility for operational strategies, in a power generation facility.

No licensing, legislative or certification requirements apply to this unit at the time of publication.

Note: Workplace practice

The application of the skills and knowledge described in this unit may require a licence or training permit to practice in the workplace where work is carried out on gas and electrical installations. Additional conditions may apply under state and territory legislative and regulatory licensing requirements.

Pre-requisite Unit

There are no prerequisite units.

Competency Field

Operations

Unit Sector

Electricity generation

Elements and Performance Criteria

ELEMENTS **PERFORMANCE CRITERIA**

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Elements describe the essential outcomes.	Performance criteria describe the performance needed to demonstrate achievement of the element.
1 Identify long and short term strategies	**1.1** Purpose of long and short term strategies are identified and clarified with all stakeholders including external organisations
	1.2 Budgets, operational, maintenance and personnel requirements are identified, in accordance with operational plan and strategies
	1.3 Data and operational information is analysed and evaluated, in accordance with operational plan and strategies
	1.4 Operating strategies are monitored and managed, for compliance with statutory regulations, industry standards and site requirements, in accordance with operational plan and strategies
	1.5 Team and individual roles and responsibilities are identified and managed, in accordance with operational plan and strategies
2 Implement and manage strategies	**2.1** Power generating plant operational procedures are reviewed and managed in consultation with stakeholders, in accordance with operational plan and strategies
	2.2 Power generating plant operations or condition is managed and reported, in accordance with statutory regulations and operational plan and strategies
	2.3 Power generating plant abnormal operating conditions are investigated and reported, in accordance with operational plan and strategies
	2.4 Critical resources and supplies for operational strategies are managed, in accordance with operational plan
	2.5 Human resource requirements are managed, in accordance with operational plan and strategies
	2.6 Debriefings are conducted, in accordance with operational plan procedures
3 Report outcomes of strategies	**3.1** Improvements to operational strategies are identified and managed, in consultation with all stakeholders

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3.2 Results of debriefings are reported, in accordance with operational plan procedures

3.3 Improvements to operational strategies are implemented and managed, in accordance with statutory regulations and operational plan

Foundation Skills

Foundation skills essential to performance are explicit in the performance criteria of this unit of competency.

Range of Conditions

Range is restricted to essential operating conditions and any other variables essential to the work environment.

Non-essential conditions may be found in the Companion Volume Implementation Guide.

Unit Mapping Information

This unit replaces and is equivalent to UEPOPS529A Manage operational strategies for power production.

Links

Companion Volume implementation guides are found in VETNet - https://vetnet.gov.au/Pages/TrainingDocs.aspx?q=1715b9fa-e7bd-441c-bb8d-cf22c9c825a8

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Assessment Requirements for UEPOPS529 Manage operational strategies for power production

Modification History

Release 1. This is the first release of this unit of competency in the UEP Generation Training Package.

Performance Evidence

Evidence required to demonstrate competence in this unit must be relevant to and satisfy all the requirements of the elements, performance criteria and range of conditions on at least two separate occasions and includes:

- applying Work, Health and Safety (WHS)/Occupational Health and Safety (OHS) requirements including:
  - emergency procedures and techniques
  - risk control measures
  - safe working practices
- communicating with personnel and stakeholders
- determining and managing operational strategies
- identifying long and short term operational strategies
- identifying plant status using data analysis techniques and tools
- implementing legislation, industry standards, codes of practice and regulations
- instigating and monitoring operational strategies
- managing generation plant and operating parameters
- managing human resources in power production
- reporting outcomes of power generation production
- utilising stakeholder management techniques

Knowledge Evidence

Evidence required to demonstrate competence in this unit must be relevant to and satisfy all the requirements of the elements, performance criteria and range of conditions and includes knowledge of:

- identification of power generation plant status
- legislation, industry standards, codes of practice and regulations
- measurement and analysis systems and procedures including data collection and analysing techniques
- operational strategy practices
- power generation plant and equipment, its location and operating parameters
- stakeholder liaison and management techniques

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- typical arrangements of power production plant
- WHS/OHS legislated requirements including:
  - emergency procedures
  - risk control measures
  - safe working practices
- workplace documentation
- workplace policies and procedures

Assessment Conditions

As a minimum, assessors must satisfy applicable regulatory requirements, which include requirements in the Standards for Registered Training Organisations current at the time of assessment.

As a minimum, assessment must satisfy applicable regulatory requirements, which include requirements in the Standards for Registered Training Organisations current at the time of assessment.

Assessment processes and techniques must be appropriate to the language, literacy and numeracy requirements of the work being performed and the needs of the candidate.

Assessment must occur in workplace operational situations. Where this is not appropriate, assessment must occur in simulated workplace operational situations that reflect workplace conditions.

Resources for assessment must include access to:

- a range of relevant exercises, case studies and/or other simulations
- relevant and appropriate materials, tools, equipment and personal protective equipment currently used in industry
- applicable documentation including workplace procedures, industry standards, equipment specifications, regulations, codes of practice and operation manuals

Links

Companion Volume implementation guides are found in VETNet - https://vetnet.gov.au/Pages/TrainingDocs.aspx?q=1715b9fa-e7bd-441c-bb8d-cf22c9c825a8

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UETTDRCJ21A Lay ESI electrical cables

Modification History

Not applicable.

Unit Descriptor

Unit Descriptor **1) Scope:**

1.1) Descriptor

This Competency Standard Unit covers the laying of cables for electrical purposes and includes the laying of ducts and/or conduit for such cables. It could include direct laying of cables in trenches, on racks, in troughs and /or in conduit or ducts. It also encompasses cable pulling methods, pulling tensions, minimum bending radii, reduction of frictional forces, use of supporting plant (e.g. dynamometers, rigging, winches), working on FRC, PVC, A/C ducted systems and the sealing of cables.

Application of the Unit

Application of the Unit **2)**

This Competency Standard Unit is intended to augment formally acquired competencies. It is suitable for employment-based programs under an approved contract of training.

Licensing/Regulatory Information

License to practice **3)**

The skills and knowledge described in this unit may require a licence/registration to practice in the work place subject to regulations for undertaking of electrical work. Practice in workplace and during training is also subject to regulations directly related to Occupational Health and Safety, electricity/telecommunications/gas/water industry

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License to practice **3)**

safety and compliance, industrial relations, environmental protection, anti discrimination and training. Commonwealth, State/Territory or Local Government legislation and regulations may exist that limits the age of operating certain equipment.

Pre-Requisites

Prerequisite Unit(s) **4)**

Competencies **4.1)**

Granting of competency in this unit shall be made only after competency in the following unit(s) has/have been confirmed.

Where pre-requisite pathways have been identified. All competencies in the Common Unit Group must be have been completed.

Common Unit Group

Unit Code	Unit Title
UEENEEE101A	Apply Occupational Health and Safety regulations, codes and practices in the workplace
UEENEEE107A	Use drawings, diagrams, schedules, standards, codes and specifications
UETTDREL11A	Apply sustainable energy and environmental procedures
UETTDREL16A	Working safely near live electrical apparatus

Literacy and numeracy skills **4.2)**

Participants are best equipped to achieve this unit if they have reading, writing and numeracy skills indicated by the following scales. Description of each scale is given in Volume 2, Part 3 “Literacy and Numeracy”.

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Reading 3 Writing 3 Numeracy 3

Employability Skills Information

Employability Skills **5)**

The required outcomes described in this unit of competency contain applicable facets of Employability Skills. The Employability Skills Summary of the qualification in which this unit of competency is packaged will assist in identifying Employability Skill requirements.

Elements and Performance Criteria Pre-Content

6) Elements describe the essential outcomes of a competency standard unit

Performance Criteria describe the required performance needed to demonstrate achievement of the element. Assessment of performance is to be consistent with the Evidence Guide.

Elements and Performance Criteria

ELEMENT	PERFORMANCE CRITERIA
1 Prepare to lay electrical cables	1.1 Works schedule(s), including drawings, plans, requirements, established procedures, and material lists, are received and confirmed, if necessary, by site inspection
	1.2 Relevant requirements and established procedures for the work are discussed with other personnel and identified for all work sites
	1.3 OHS policies and procedures related to requirements and established procedures for the laying of electrical cables are obtained and confirmed for the purposes of the work to be performed and communicated
	1.4 Work is prioritised and sequenced following consultation with others for completion within

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ELEMENT	PERFORMANCE CRITERIA	
		acceptable timeframes and in accordance with established procedures
	1.5	Hazards are identified, OHS risks assessed and control measures are prioritised, implemented and monitored including emergency exits kept clear according to established procedures.
	1.6	Relevant work permits are obtained to access and perform work according to requirements and/or established procedures.
	1.7	Resources including personnel, equipment, tools and personal protective equipment required for the job are obtained and confirmed in working order.
	1.8	Relevant personnel at work site are confirmed current in First Aid and other related work procedures according to requirements.
	1.9	Liaison and communication issues with other/authorised personnel, authorities, clients and land owners are resolved to carry out work where necessary.
	1.10	Site is prepared according to the work schedule and to minimise risk and damage to property, commerce, and individuals in accordance with established procedures.
	1.11	Personnel participating in the work, including plant operators and contractors, are fully briefed and respective responsibilities confirmed where applicable in accordance with established procedures.
	1.12	Traffic management plan is identified and implemented.
2 Carry out the laying of electrical cables	2.1	OHS, sustainable energy and environmental principles and practices to reduce the incidents of accidents and minimise waste are followed in accordance with requirements and/or established procedures.
	2.2	Lifting, climbing, working in confined spaces and aloft, and use of power tools/equipment,

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ELEMENT	PERFORMANCE CRITERIA	
		techniques and practices are safely followed and, currency according to requirements confirmed.
	2.3	Essential knowledge and associated skills are applied in the safe laying of electrical cables to ensure completion in an agreed timeframe and, to quality standards with a minimum of waste according to requirements.
	2.4	Electrical cables are laid in accordance with the work schedule and requirements/established procedures.
	2.5	Hazard warnings and safety signs are recognised and hazards and assessed OHS risks are reported to the immediate authorised persons for directions according to established procedures.
	2.6	Unplanned events in the laying of electrical cables are undertaken within the scope of established procedures.
	2.7	Known solutions to a variety of problems are applied using routine procedures.
	2.8	Ongoing checks of quality of the work are undertaken in accordance with instructions and established procedures.
3 Complete the laying of electrical cables	3.1	Work undertaken is checked against works schedule for conformance with requirements and anomalies reported in accordance with established procedures.
	3.2	Accidents and/or injuries are reported in accordance with requirements/established procedures, where applicable.
	3.3	Work site is rehabilitated, cleaned up and made safe in accordance with established procedures.
	3.4	Tools, equipment and any surplus resources and materials are, where appropriate, cleaned, checked and returned to storage or disposed of in accordance with established procedures.
	3.5	Relevant work permit(s), works completion records, reports, drawings and/or documentation

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ELEMENT	PERFORMANCE CRITERIA	
		and information are actually completed and appropriate personnel notified.
	3.6	Works completion records, reports, as installed /modified drawing and/or documentation and information are finalised and processed and appropriate personnel notified

Required Skills and Knowledge

REQUIRED SKILLS AND KNOWLEDGE

8) Essential knowledge and associated skills (EKAS): This describes the essential skills and knowledge and their level, required for this unit.

Evidence shall show that knowledge has been acquired of laying ESI electrical cables.

All knowledge and skills detailed in this unit should be contextualised to current industry practices and technologies.

KS01-TCJ21A Underground cable installation and safety

Evidence shall show an understanding of the installation of underground cable to an extent indicated by the following aspects:

T1 Requirements for the use of enterprise construction manuals, system diagrams/plans and drawings

T2 Safety precautions specific to the installation of underground cable encompassing:

- Excavation and trench safety regulations
- Gas detection procedures
- Working in confined spaces
- Personal protective equipment
- Hazards for the use of LPG equipment for jointing of underground cable
- Gas bottle testing procedures
- Permit to work systems and isolation procedures
- Trench excavation and reinstatement procedures
- Rescue victims from confined spaces

Note: Examples include planning, identifying the procedures and establishing responses, developing techniques, involvement of external emergency services and practical demonstration/rehearsals of rescuing a person from confined spaces and emergency procedures for the rescue of an electric shock victim including CPR.

T3 Installation of underground cable procedures encompassing:

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REQUIRED SKILLS AND KNOWLEDGE

- Types of tools and equipment

T4 Methods of cable handling encompassing:

- Direct laid cables
- Duct laid cables
- Solid laid cables
- Cables supported in cleats or hangers
- Corrosion protection
- Minimum bending radius of cables

T5 Methods of cable sealing encompassing:

- Shorting of cables cores
- Core of unterminated cables
- Methods of protection from corrosion
- Polymeric sheathed cables sealing with mastic lined
- Heat shrink caps buried sealed ends

T6 Methods of installing conduits

T7 Procedures for the safe use of LPG equipment for cable jointing

T8 Traffic management

Note: Examples include purpose of traffic management and a power worker's responsibilities in accordance with relevant statutory requirements and electricity supply industry requirements, demonstration of the procedure used to provide an effective traffic management scheme and the use of a two-way radio

T9 Procedures for purchasing/ordering items, removing/dispatching items, stocktaking, and record keeping

KS02-TCJ21A Underground cable construction

Evidence shall show an understanding of the construction and types of underground cables to an extent indicated by the following aspects:

T1 Safety precautions specific to handling underground cables

T2 Requirements for the use of enterprise manuals, system diagrams/plans and drawings

T3 Types and applications of underground cables

T4 Construction types and structures of underground cables

T5 Characteristics of different types of underground cables

T6 Ratings

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Evidence Guide

EVIDENCE GUIDE

9) This provides essential advice for assessment of the unit of competency and must be read in conjunction with the performance criteria and the range statement of the unit of competency and the Training Package Assessment Guidelines.

The Evidence Guide forms an integral part of this Competency Standard Unit and shall be used in conjunction with all component parts of this unit and, performed in accordance with the Assessment Guidelines of this Training Package.

Overview of Assessment **9.1)**

Longitudinal competency development approaches to assessment, such as Profiling, require data to be reliably gathered in a form that can be consistently interpreted over time. This approach is best utilised in Apprenticeship programs and reduces assessment intervention. It is the Industry's preferred model for apprenticeships. However, where summative (or final) assessment is used it is to include the application of the competency in the normal work environment or, at a minimum, the application of the competency in a realistically simulated work environment. It is recognised that, in some circumstances, assessment in part or full can occur outside the workplace. However, it must be in accord with Industry and, Regulatory policy in this regard.

Methods chosen for a particular assessment will be influenced by various factors. These include the extent of the assessment, the most effective locations for the assessment activities to take place, access to physical resources, additional safety measures that may be required and the critical nature of the competencies being assessed.

The critical safety nature of working with electricity, electrical equipment, gas or any other hazardous substance/material carries risk in deeming a person competent. Hence, sources of evidence need to be 'rich' in nature so as to minimise error in judgment.

Activities associated with normal every day work have a bearing on the decision as to how much and how detailed the data gathered will contribute to its 'richness'. Some skills are more critical to safety and operational requirements while the same skills may be more or less frequently practiced. These points are raised for the assessors to consider when choosing an assessment method and developing assessment instruments. Sample assessment instruments are included for Assessors in the Assessment Guidelines of this Training Package.

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Critical aspects of evidence required to demonstrate competency in this unit **9.2)**

Before the critical aspects of evidence are considered all prerequisites shall be met.

Evidence for competence in this unit shall be considered holistically. Each element and associated performance criteria shall be demonstrated on at least two occasions in accordance with the "Assessment Guidelines – UET12". Evidence shall also comprise:

- A representative body of performance criteria demonstrated within the timeframes typically expected of the discipline, work function and industrial environment. In particular this shall incorporate evidence that shows a candidate is able to:
  - Implement Occupational Health and Safety workplace procedures and practices including the use of risk control measures as specified in the performance criteria and range; and
  - Apply sustainable energy principles and practices as specified in the performance criteria and range; and
  - Demonstrate an understanding of the essential knowledge and associated skills as described in this unit to such an extent that the learner's performance outcome is reported in accordance with the preferred approach; namely a percentile graded result, where required by the regulated environment; and
  - Demonstrate an appropriate level of employability skills; and
- Conduct work observing the relevant Anti Discrimination legislation, regulations, policies and workplace procedures; and
  - Demonstrated performance across a representative range of contexts from the prescribed items below:

Range of tools/equipment/materials/procedures/workplaces/other variables		
Group No	**The minimum number of items on which skill is to**	**Item List**

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	be demonstrated	
A	At least one of the following:	HV polymeric HV paper insulated
B	At least one of the following:	LV polymeric LV paper insulated
C	At least one of the following:	Direct lay On racks In conduits
D	At least one cable pulling methods of the following:	Stocking pulling Bond pulling Armour pulling Nose pull attachments
E	At least two cable sealing methods of the following:	Heat shrinkable Pre-stretched materials Tin/lead wiping Pre-moulded components
F	At least one cable cutting methods of the following:	Hydraulic cutters Electric reciprocating Motorised Hand tools
G	At least four of the following:	Drum jacks Winches Spindles Capstans Bollards Cable trailers Rollers Lubricants Ropes Bell mouths

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		Draw wires/rods
H	At least one occasion	Dealing with an unplanned event by drawing on essential knowledge and associated skills to provide appropriate solutions incorporated in the holistic assessment with the above listed items.

Context of and specific resources for assessment **9.3)**

This unit should be assessed as it relates to normal work practice using procedures, information and resources typical of a workplace. This should include:

- OHS policy and work procedures and instructions.
- Suitable work environment, facilities, equipment and materials to undertake actual work as prescribed by this Competency Standard Unit.

In addition to the resources listed above, in context of and specific resources for assessment, evidence should show demonstrated competency working below ground, in limited spaces, with different structural/construction types and method and in a variety of environments.

Method of assessment **9.4)**

This Competency Standard Unit shall be assessed by methods given in Volume 1, Part 3 “Assessment Guidelines”.

Note:

Competent performance with inherent safe working practices is expected in the Industry to which this Competency Standard Unit applies. This requires that the specified essential knowledge and associated skills are assessed in a structured environment which is primarily intended for learning/assessment and incorporates all necessary equipment and facilities for learners to develop and

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demonstrate the essential knowledge and associated skills described in this unit.

Concurrent assessment and relationship with other units

9.5)

For optimisation of training and assessment effort, competence in this unit may be assessed concurrently with the following units:

UETTDRCJ22A	Install and maintain de-energised low voltage underground paper insulated cables.
UETTDRCJ26A	Install and maintain de-energised low voltage underground polymeric cables.

Range Statement

RANGE STATEMENT

10) This relates to the unit of competency as a whole providing the range of contexts and conditions to which the performance criteria apply. It allows for different work environments and situations that will affect performance.

This Competency Standard Unit shall be demonstrated in relation to the laying of cables for electrical purposes and includes the laying of ducts and/or conduit for electrical cables.

The unit includes the laying of cables direct in trenches, on racks, in troughs and /or in conduit or ducts.

It also encompasses cable pulling methods, pulling tensions, minimum bending radii, reduction of frictional forces, use of supporting plant (e.g. dynamometers, rigging, winches, etc), working on FRC, PVC, A/C ducted systems and the cutting and sealing of cables.

The following constants and variables included in the element/performance criteria in this unit are fully described in the Definitions Section 1 of this volume and form an integral part of the Range Statement of this unit:

- Appropriate and relevant persons (see Personnel)
- Appropriate authorities
- Appropriate work platform
- Assessing risk
- Assessment

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RANGE STATEMENT

- Authorisation
- Confined space
- Documenting detail work events, record keeping and or storage of information.
- Drawings and specifications
- Emergency
- Environmental and sustainable energy procedures
- Environmental legislation
- Environmental management documentation
- Established procedures
- Fall prevention
- Hazards
- Identifying hazards
- Inspect
- Legislation
- MSDS
- Notification
- OHS practices
- OHS issues
- Permits and/or permits to work
- Personnel

Unit Sector(s)

Not applicable.

Competency Field

Competency Field **11)**

Cable Jointing

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UETTDRCJ26A Install and maintain de-energised low voltage underground polymeric cables

Modification History

Not applicable.

Unit Descriptor

Unit Descriptor **1) Scope:**

1.1) Descriptor

This Competency Standard Unit covers the installation and maintenance of de-energised low voltage underground polymeric cables and covers the jointing, terminating, repair and replacement of cables. It includes the isolation of systems and circuits, the procedure of issuing/accepting electrical access permits, the undertaking of pre-commissioning and/or re-commissioning tests and the updating of system data/maintenance records.

Application of the Unit

Application of the Unit **2)**

This Competency Standard Unit is intended to augment formally acquired competencies. It is suitable for employment-based programs under an approved contract of training.

Licensing/Regulatory Information

License to practice **3)**

The skills and knowledge described in this unit may require a licence/registration to practice in the work place subject to regulations for undertaking of electrical work. Practice in workplace and during training is also subject to regulations directly related to Occupational Health and

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License to practice **3)**

Safety, electricity/telecommunications/gas/water industry safety and compliance, industrial relations, environmental protection, anti discrimination and training. Commonwealth, State/Territory or Local Government legislation and regulations may exist that limits the age of operating certain equipment.

Pre-Requisites

Prerequisite Unit(s) **4)**

Competencies **4.1)**

Granting of competency in this unit shall be made only after competency in the following unit(s) has/have been confirmed.

Where pre-requisite pathways have been identified. All competencies in the Common Unit Group must be have been completed plus all the competencies in one (1) of the identified Pathway Unit Group(s):

Common Unit Group

Unit Code	Unit Title
UEENEEE101A	Apply Occupational Health and Safety regulations, codes and practices in the workplace
UEENEEE102A	Fabricate, assemble and dismantle utilities industry components
UEENEEE105A	Fix and secure electrotechnology equipment
UEENEEE107A	Use drawings, diagrams, schedules, standards, codes and specifications
UETTDRCJ21A	Lay ESI electrical cables
UETTDREL11A	Apply sustainable energy and environmental procedures
UETTDREL16A	Working safely near live electrical apparatus

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Literacy and numeracy skills **4.2)**

Participants are best equipped to achieve this unit if they have reading, writing and numeracy skills indicated by the following scales. Description of each scale is given in Volume 2, Part 3 “Literacy and Numeracy”.

Reading 3 Writing 3 Numeracy 3

Employability Skills Information

Employability Skills **5)**

The required outcomes described in this unit of competency contain applicable facets of Employability Skills. The Employability Skills Summary of the qualification in which this unit of competency is packaged will assist in identifying Employability Skill requirements.

Elements and Performance Criteria Pre-Content

6) Elements describe the essential outcomes of a competency standard unit

Performance Criteria describe the required performance needed to demonstrate achievement of the element. Assessment of performance is to be consistent with the Evidence Guide.

Elements and Performance Criteria

ELEMENT	PERFORMANCE CRITERIA
1 Prepare for the installation and maintenance of de-energised LV underground polymeric cables	1.1 Works schedule(s), including drawings, plans, requirements, established procedures, and material lists, are received, analysed and confirmed, if necessary, by site inspection
	1.2 Relevant requirements and established procedures for the work are communicated to all

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ELEMENT	PERFORMANCE CRITERIA	
		personnel and identified for all work sites
	1.3	OHS policies and procedures related to requirements and established procedures for the installation and maintenance of de-energised LV underground polymeric cables are obtained and confirmed for the purposes of the work to be performed and communicated
	1.4	Work is prioritised and sequenced following consultation with others for completion within acceptable timeframes and in accordance with established procedures
	1.5	Hazards are identified, OHS risks assessed and control measures are prioritised, implemented and monitored including emergency exits kept clear according to established procedures.
	1.6	Relevant work permits are obtained to access and perform work according to requirements and/or established procedures
	1.7	Resources including personnel, equipment, tools and personal protective equipment required for the job are obtained and confirmed in working order
	1.8	Relevant personnel at work site are confirmed current in First Aid and other related work procedures according to requirements
	1.9	Liaison and communication issues with other/authorised personnel, authorities, clients and land owners are resolved to carry out work where necessary
	1.10	Site is prepared according to the work schedule and to minimise risk and damage to property, commerce, and individuals in accordance with established procedures
	1.11	Personnel participating in the work, including plant operators and contractors, are fully briefed and respective responsibilities confirmed where applicable in accordance with established procedures

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ELEMENT	PERFORMANCE CRITERIA	
	1.12	Road signs, barriers and warning devices are positioned in accordance with requirements
2 Carry out the installation and maintenance of de-energised LV underground polymeric cables	2.1	OHS and sustainable energy principles and practices to reduce the incidents of accidents and minimise waste are monitored and followed in accordance with requirements and/or established procedures
	2.2	Lifting, climbing, working in confined spaces and working aloft, and use of power tools/equipment, techniques and practices are safely followed and, currency according to requirements confirmed
	2.3	Systems and circuits are isolated as required, proved safe to work on in accordance with the requirements/permits and established procedures
	2.4	Essential knowledge and associated skills are applied for the safe installation and maintenance of de-energised LV underground polymeric cables to ensure completion in an agreed timeframe and, to quality standards with a minimum of waste according to requirements
	2.5	De-energised LV underground polymeric cables are installed according to the work schedule and requirements/established procedures
	2.6	Maintenance, including repair and/or replacement of LV underground polymeric cables is carried out, in accordance with the work schedule and requirements/established procedures
	2.7	Hazard warnings and safety signs are recognised and hazards and assessed OHS risks are reported to the immediate authorised persons for directions according to established procedures.
	2.8	Unplanned events in the installation and maintenance of de-energised LV underground polymeric cables are undertaken within the scope of established procedures
	2.9	Known solutions to a variety of problems are

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ELEMENT	PERFORMANCE CRITERIA	
		applied using acquired essential knowledge and associated skills
	2.10	Ongoing checks of quality of the work are undertaken in accordance with instructions and established procedures
3 Complete the installation and maintenance of de-energised LV underground polymeric cables	3.1	Work undertaken is checked against works schedule for conformance with requirements and anomalies reported in accordance with established procedures
	3.2	Accidents and/or injuries are reported in accordance with requirements/established procedures, where applicable
	3.3	Work site is rehabilitated, cleaned up and made safe in accordance with established procedures
	3.4	Tools, equipment and any surplus resources and materials are, where appropriate, cleaned, checked and returned to storage in accordance with established procedures
	3.5	Relevant work permit(s) are signed off and LV underground polymeric cables are returned to service in accordance with requirements
	3.6	Works completion records, reports, drawings and/or documentation and information are finalised and processed and appropriate personnel notified

Required Skills and Knowledge

REQUIRED SKILLS AND KNOWLEDGE

8) Essential knowledge and associated skills (EKAS): This describes the essential skills and knowledge and their level, required for this unit.

Evidence shall show that knowledge has been acquired of installing and maintaining de-energised LV underground polymeric cables.

All knowledge and skills detailed in this unit should be contextualised to current industry practices and technologies.

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REQUIRED SKILLS AND KNOWLEDGE

KS01-TCJ26A LV Polymeric cable jointing

Evidence shall show an understanding of the types of cables, tools and equipment used in the jointing and termination of LV polymeric cable to an extent indicated by the following aspects:

T1 Standards, codes, legislation, supply authority regulations and or enterprise requirements pertaining to the jointing of LV polymeric cables

T2 Types of jointing tools

T3 Techniques in the use of LPG encompassing:

- Safety precautions
- Personal protective equipment
- General maintenance and repair

T4 Techniques in jointing LV XLPE cables encompassing:

- Straight through joint
- Jointing different types of cable
- Service and street light cable joints

T5 Techniques in terminating LV XLPE encompassing:

- Pole top terminations
- Substation terminations
- Distribution pillar/column/cubicle terminations
- Service and street light cable terminations

T6 Techniques in repairing LV XLPE cable encompassing:

- Different types of damage
- Repairs to sheath
- Repairs to cores

T7 Methods of testing cable after jointing

Evidence Guide

EVIDENCE GUIDE

9) This provides essential advice for assessment of the unit of competency and must be read in conjunction with the performance criteria and the range statement of the unit of competency and the Training Package Assessment Guidelines.

The Evidence Guide forms an integral part of this Competency Standard Unit and shall be used in conjunction with all component parts of this unit and, performed in accordance with the Assessment Guidelines of this Training Package.

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Overview of Assessment **9.1)**

Longitudinal competency development approaches to assessment, such as Profiling, require data to be reliably gathered in a form that can be consistently interpreted over time. This approach is best utilised in Apprenticeship programs and reduces assessment intervention. It is the Industry's preferred model for apprenticeships. However, where summative (or final) assessment is used it is to include the application of the competency in the normal work environment or, at a minimum, the application of the competency in a realistically simulated work environment. It is recognised that, in some circumstances, assessment in part or full can occur outside the workplace. However, it must be in accord with Industry and, Regulatory policy in this regard.

Methods chosen for a particular assessment will be influenced by various factors. These include the extent of the assessment, the most effective locations for the assessment activities to take place, access to physical resources, additional safety measures that may be required and the critical nature of the competencies being assessed.

The critical safety nature of working with electricity, electrical equipment, gas or any other hazardous substance/material carries risk in deeming a person competent. Hence, sources of evidence need to be 'rich' in nature so as to minimise error in judgment.

Activities associated with normal every day work have a bearing on the decision as to how much and how detailed the data gathered will contribute to its 'richness'. Some skills are more critical to safety and operational requirements while the same skills may be more or less frequently practiced. These points are raised for the assessors to consider when choosing an assessment method and developing assessment instruments. Sample assessment instruments are included for Assessors in the Assessment Guidelines of this Training Package.

Critical aspects of evidence required to demonstrate competency in this unit **9.2)**

Before the critical aspects of evidence are considered all

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prerequisites shall be met.

Evidence for competence in this unit shall be considered holistically. Each element and associated performance criteria shall be demonstrated on at least two occasions in accordance with the "Assessment Guidelines – UET12". Evidence shall also comprise:

- A representative body of performance criteria demonstrated within the timeframes typically expected of the discipline, work function and industrial environment. In particular this shall incorporate evidence that shows a candidate is able to:
  - Implement Occupational Health and Safety workplace procedures and practices including the use of risk control measures as specified in the performance criteria and range; and
  - Apply sustainable energy principles and practices as specified in the performance criteria and range; and
  - Demonstrate an understanding of the essential knowledge and associated skills as described in this unit to such an extent that the learner's performance outcome is reported in accordance with the preferred approach; namely a percentile graded result, where required by the regulated environment; and
  - Demonstrate an appropriate level of employability skills; and
- Conduct work observing the relevant Anti Discrimination legislation, regulations, policies and workplace procedures; and
  - Demonstrated performance across a representative range of contexts from the prescribed items below:

Range of tools/equipment/materials/procedures/workplaces/other variables		
Group No	**The minimum number of items on which skill is to be demonstrated**	**Item List**
A	All of the following:	LV polymeric cable
B	Any two of the following:	Tee-off joints Straight through joints Parallel branch joints Parallel joints

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C	At least one of the following:	Transformers, LV switchboards Pillars/turrets Lighting columns Ring main units Chamber substations
D	At least two of the following:	Busbar/termination boxes Links/Fuses Disconnect boxes Termination boxes Control gear UG/OH terminations Circuit breakers
E	At least one of the following:	Resin filled boxes, Compound filled boxes Polymeric tape Heat shrink Slip-on' moulds Pre-stretched polymeric
F	At least one of the following:	Compression lugs Welded connections Mechanical connectors Insulation piercing connectors
G	All of the following:	Insulation resistance testers Voltage detectors
H	At least one occasion	Dealing with an unplanned event by drawing on essential knowledge and associated skills to provide appropriate

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		solutions incorporated in the holistic assessment with the above listed items.

Context of and specific resources for assessment **9.3)**

This unit should be assessed as it relates to normal work practice using procedures, information and resources typical of a workplace. This should include:

- OHS policy and work procedures and instructions.
- Suitable work environment, facilities, equipment and materials to undertake actual installation and maintenance on de-energised low voltage underground polymeric cables.

In addition to the resources listed above, in context of and specific resources for assessment, evidence should show demonstrated competency working below ground, in limited spaces, with different structural/construction types and method and in a variety of environments.

Method of assessment **9.4)**

This Competency Standard Unit shall be assessed by methods given in Volume 1, Part 3 “Assessment Guidelines”.

Note:

Competent performance with inherent safe working practices is expected in the Industry to which this Competency Standard Unit applies. This requires that the specified essential knowledge and associated skills are assessed in a structured environment which is primarily intended for learning/assessment and incorporates all necessary equipment and facilities for learners to develop and demonstrate the essential knowledge and associated skills described in this unit.

Concurrent assessment and relationship with **9.5)**

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other units

For optimisation of training and assessment effort, competence in this unit may be assessed concurrently with the following units:

UETTDRCJ22A	Install and maintain de-energised low voltage underground paper insulated cables.
UETTDRCJ27A	Install and maintain de-energised high voltage underground polymeric cables.

Range Statement

RANGE STATEMENT

10) This relates to the unit of competency as a whole providing the range of contexts and conditions to which the performance criteria apply. It allows for different work environments and situations that will affect performance.

This Competency Standard Unit shall be demonstrated in relation to the installation and maintenance of de-energised low voltage underground polymeric cables and covers the jointing, terminating, repair and replacement of cables used in systems and circuits and the issuing/accepting of relevant permits.

Test and recording equipment may include voltage detectors, tong ammeters, cable identification equipment, and insulation resistance testers.

Jointing and terminating materials may include compound and resin filled boxes, polymeric tape materials, polymeric heat shrink materials, "slip-on" moulded components and pre-stretched polymeric materials, compression, welded and mechanical connectors.

Jointing and terminating equipment and locations may include links, fuses, disconnect boxes, ring main units, distribution fuse boxes, pad mount and ground transformers, chamber substations, LV switchboards, pillars/turrets, busbar/termination boxes, street lighting control points and street lighting columns.

The following constants and variables included in the element/performance criteria in this unit are fully described in the Definitions Section 1 of this volume and form an integral part of the Range Statement of this unit:

- Appropriate and relevant persons (see Personnel)
- Appropriate authorities
- Appropriate work platform
- Assessing risk
- Assessment
- Authorisation
- Confined space

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RANGE STATEMENT

- Diagnostic, testing and restoration
- Documenting detail work events, record keeping and or storage of information
- Drawings and specifications
- Emergency
- Environmental and sustainable energy procedures
- Environmental legislation
- Environmental management documentation
- Established procedures
- Fall prevention
- Hazards
- Identifying hazards
- Inspect
- Legislation
- MSDS
- Notification
- OHS practices
- OHS issues
- Permits and/or permits to work
- Personnel
- Quality assurance systems
- Requirements
- Testing procedures
- Work clearance systems

Unit Sector(s)

Not applicable.

Competency Field

Competency Field **11)**

Cable Jointing

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UETTDRCJ27A Install and maintain de-energised high voltage underground polymeric cables

Modification History

Not applicable.

Unit Descriptor

Unit Descriptor **1) Scope:**

1.1) Descriptor

This Competency Standard Unit covers the installation and maintenance of de-energised high voltage underground polymeric cables and covers the jointing, terminating, repair and replacement of cables. It includes the isolation of systems and circuits, the procedure of issuing/accepting electrical access permits, the undertaking of pre-commissioning and/or re-commissioning tests and the updating of system data/maintenance records.

Application of the Unit

Application of the Unit **2)**

This Competency Standard Unit is intended to augment formally acquired competencies. It is suitable for employment-based programs under an approved contract of training.

Licensing/Regulatory Information

License to practice **3)**

The skills and knowledge described in this unit may require a licence/registration to practice in the work place subject to regulations for undertaking of electrical work. Practice in workplace and during training is also subject to regulations directly related to Occupational Health and

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License to practice **3)**

Safety, electricity/telecommunications/gas/water industry safety and compliance, industrial relations, environmental protection, anti discrimination and training. Commonwealth, State/Territory or Local Government legislation and regulations may exist that limits the age of operating certain equipment.

Pre-Requisites

Prerequisite Unit(s) **4)**

Competencies **4.1)**

Granting of competency in this unit shall be made only after competency in the following unit(s) has/have been confirmed.

Where pre-requisite pathways have been identified. All competencies in the Common Unit Group must be have been completed plus all the competencies in one (1) of the identified Pathway Unit Group(s):

Common Unit Group

Unit Code	Unit Title
UEENEEE101A	Apply Occupational Health and Safety regulations, codes and practices in the workplace
UEENEEE102A	Fabricate, assemble and dismantle utilities industry components
UEENEEE105A	Fix and secure electrotechnology equipment
UEENEEE107A	Use drawings, diagrams, schedules, standards, codes and specifications
UETTDRCJ21A	Lay ESI electrical cables
UETTDREL11A	Apply sustainable energy and environmental procedures
UETTDREL16A	Working safely near live electrical apparatus

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Literacy and numeracy skills	**4.2)**

Participants are best equipped to achieve this unit if they have reading, writing and numeracy skills indicated by the following scales. Description of each scale is given in Volume 2, Part 3 “Literacy and Numeracy”.

Reading 3 Writing 3 Numeracy 3

Employability Skills Information

Employability Skills	**5)**

The required outcomes described in this unit of competency contain applicable facets of Employability Skills. The Employability Skills Summary of the qualification in which this unit of competency is packaged will assist in identifying Employability Skill requirements.

Elements and Performance Criteria Pre-Content

6) Elements describe the essential outcomes of a competency standard unit	Performance Criteria describe the required performance needed to demonstrate achievement of the element. Assessment of performance is to be consistent with the Evidence Guide.

Elements and Performance Criteria

ELEMENT		PERFORMANCE CRITERIA	
1	Prepare to the installation and maintenance of de-energised HV underground polymeric cables	1.1	Works schedule(s), including drawings, plans, requirements, established procedures, and material lists, are received, analysed and confirmed, if necessary, by site inspection.
		1.2	Relevant requirements and established procedures for the work are communicated to

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ELEMENT	PERFORMANCE CRITERIA	
		all personnel and identified for all work sites.
	1.3	OHS policies and procedures related to requirements and established procedures for the installation and maintenance of de-energised HV underground polymeric cables are obtained and confirmed for the purposes of the work to be performed and communicated.
	1.4	Work is prioritised and sequenced following consultation with others for completion within acceptable timeframes and in accordance with established procedures.
	1.5	Hazards are identified, OHS risks assessed and control measures are prioritised, implemented and monitored including emergency exits kept clear according to established procedures.
	1.6	Relevant work permits are obtained to access and perform work according to requirements and/or established procedures.
	1.7	Resources including personnel, equipment, tools and personal protective equipment required for the job are obtained and confirmed in working order.
	1.8	Relevant personnel at work site are confirmed current in First Aid and other related work procedures according to requirements.
	1.9	Liaison and communication issues with other/authorised personnel, authorities, clients and land owners are resolved to carry out work where necessary.
	1.10	Site is prepared according to the work schedule and to minimise risk and damage to property, commerce, and individuals in accordance with established procedures.
	1.11	Personnel participating in the work, including plant operators and contractors, are fully briefed and respective responsibilities confirmed where applicable in accordance with established procedures.

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ELEMENT	PERFORMANCE CRITERIA	
	1.12	Road signs, barriers and warning devices are positioned in accordance with requirements.
2 Carry out the installation and maintenance of de-energised HV underground polymeric cables	2.1	OHS and sustainable energy principles and practices to reduce the incidents of accidents and minimise waste are monitored and followed in accordance with requirements and/or established procedures.
	2.2	Lifting, climbing, working in confined spaces and aloft, and use of power tools/equipment, techniques and practices are safely followed and, currency according to requirements confirmed.
	2.3	Systems and circuits are isolated as required, proved safe to work on in accordance with the requirements/permits and established procedures.
	2.4	Essential knowledge and associated skills are applied in the safe installation and maintenance of de-energised HV underground polymeric cables to ensure completion in an agreed timeframe and, to quality standards with a minimum of waste according to requirements.
	2.5	De-energised HV underground polymeric cables are installed according the work schedule and requirements/established procedures.
	2.6	Maintenance, including repair and/or replacement of de-energised HV underground polymeric cables is carried out, in accordance with the work schedule and requirements/established procedures.
	2.7	Hazard warnings and safety signs are recognised and hazards and assessed OHS risks are reported to the immediate authorised persons for directions according to established procedures.
	2.8	Unplanned events in the installation and maintenance of de-energised HV underground polymeric cables are undertaken within the

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ELEMENT	PERFORMANCE CRITERIA	
		scope of established procedures.
	2.9	Known solutions to a variety of problems are applied using acquired essential knowledge and associated skills.
	2.10	Ongoing checks of quality of the work are undertaken in accordance with instructions and established procedures.
3 Complete the installation and maintenance of de-energised HV underground polymeric cables	3.1	Work undertaken is checked against works schedule for conformance with requirements and anomalies reported in accordance with established procedures.
	3.2	Accidents and/or injuries are reported in accordance with requirements/established procedures, where applicable.
	3.3	Work site is rehabilitated, cleaned up and made safe in accordance with established procedures.
	3.4	Tools, equipment and any surplus resources and materials are, where appropriate, cleaned, checked and returned to storage in accordance with established procedures.
	3.5	Relevant work permit(s) are signed off and, HV underground polymeric cables are returned to service in accordance with requirements.
	3.6	Works completion records, reports, as installed /modified drawing and/or documentation and information are finalised and processed and appropriate personnel notified.

Required Skills and Knowledge

REQUIRED SKILLS AND KNOWLEDGE

8) Essential knowledge and associated skills (EKAS): This describes the essential skills and knowledge and their level, required for this unit.

Evidence shall show that knowledge has been acquired of installing and maintaining de-energised HV underground polymeric cables.

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REQUIRED SKILLS AND KNOWLEDGE

All knowledge and skills detailed in this unit should be contextualised to current industry practices and technologies.

KS01-TCJ27A HV Polymeric underground cable jointing

Evidence shall show an understanding of the jointing and termination of HV polymeric cable to an extent indicated by the following aspects:

T1 Standards, codes, legislation, supply authority regulations and or enterprise requirements pertaining to the jointing of HV underground polymeric cables

T2 Requirements for the use of enterprise construction manuals, system diagrams/plans and drawings, encompassing:

- Characteristics of different types of cables and components
- Purpose of stress control

T3 Applications of various tools and equipment for HV jointing

T4 Procedure for isolating high voltage underground cables encompassing:

- Method for proving safe to work

T5 Earthing procedures

T6 Techniques in jointing HV underground polymeric cable, encompassing:

- Short circuit cores and seal cable
- Straight through
- Trifurcating

T7 Techniques in HV terminations encompassing:

- Pole top termination
- Substation/switchgear termination
- ABC termination
- Telcon termination

T8 Procedures for repairing HV underground cables encompassing:

- Location of faults
- Types of damage
- Techniques to repairs to sheath
- Techniques to repairs to core

Evidence Guide

EVIDENCE GUIDE

9) This provides essential advice for assessment of the unit of competency and must be read in conjunction with the performance criteria and the range statement of the

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EVIDENCE GUIDE

unit of competency and the Training Package Assessment Guidelines.

The Evidence Guide forms an integral part of this Competency Standard Unit and shall be used in conjunction with all component parts of this unit and, performed in accordance with the Assessment Guidelines of this Training Package.

Overview of Assessment 9.1)

Longitudinal competency development approaches to assessment, such as Profiling, require data to be reliably gathered in a form that can be consistently interpreted over time. This approach is best utilised in Apprenticeship programs and reduces assessment intervention. It is the Industry's preferred model for apprenticeships. However, where summative (or final) assessment is used it is to include the application of the competency in the normal work environment or, at a minimum, the application of the competency in a realistically simulated work environment. It is recognised that, in some circumstances, assessment in part or full can occur outside the workplace. However, it must be in accord with Industry and, Regulatory policy in this regard.

Methods chosen for a particular assessment will be influenced by various factors. These include the extent of the assessment, the most effective locations for the assessment activities to take place, access to physical resources, additional safety measures that may be required and the critical nature of the competencies being assessed.

The critical safety nature of working with electricity, electrical equipment, gas or any other hazardous substance/material carries risk in deeming a person competent. Hence, sources of evidence need to be 'rich' in nature so as to minimise error in judgment.

Activities associated with normal every day work have a bearing on the decision as to how much and how detailed the data gathered will contribute to its 'richness'. Some skills are more critical to safety and operational requirements while the same skills may be more or less frequently practiced. These points are raised for the assessors to consider when choosing an assessment method and developing assessment instruments. Sample assessment instruments are included for Assessors in the Assessment Guidelines of this Training Package.

Critical aspects 9.2)

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of evidence required to demonstrate competency in this unit

Before the critical aspects of evidence are considered all prerequisites shall be met.

Evidence for competence in this unit shall be considered holistically. Each element and associated performance criteria shall be demonstrated on at least two occasions in accordance with the "Assessment Guidelines – UET12". Evidence shall also comprise:

- A representative body of performance criteria demonstrated within the timeframes typically expected of the discipline, work function and industrial environment. In particular this shall incorporate evidence that shows a candidate is able to:
  - Implement Occupational Health and Safety workplace procedures and practices including the use of risk control measures as specified in the performance criteria and range; and
  - Apply sustainable energy principles and practices as specified in the performance criteria and range; and
  - Demonstrate an understanding of the essential knowledge and associated skills as described in this unit to such an extent that the learner's performance outcome is reported in accordance with the preferred approach; namely a percentile graded result, where required by the regulated environment; and
  - Demonstrate an appropriate level of employability skills; and
- Conduct work observing the relevant Anti Discrimination legislation, regulations, policies and workplace procedures; and
  - Demonstrated performance across a representative range of contexts from the prescribed items below:

Range of tools/equipment/materials/procedures/workplaces/other variables		
Group No	**The minimum number of items on which skill is to be demonstrated**	**Item List**

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A	All of the following:	HV polymeric cables
B	At least two of the following:	Tee-off joints Straight through joint Parallel branch joint Parallel joint
C	At least one of the following:	Transformers Ring main units Chamber substations
D	At least one of the following:	Busbar/termination boxes Links/Fuses Termination boxes Control gear Circuit breakers
E	At least two of the following:	Resin filled boxes Compound filled boxes Polymeric tape Heat shrink ‘slip-on’ moulds Pre-stretched polymeric
F	All of the following:	Insulation resistance testers Voltage detectors
G	All of the following;	Cable identification devices Cable spiking devices
H	At least two of the following:	Mechanical connectors Compression connectors Lugs
I	At least one occasion	Dealing with an unplanned event by

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		drawing on essential knowledge and associated skills to provide appropriate solutions incorporated in the holistic assessment with the above listed items.

Context of and specific resources for assessment **9.3)**

This unit should be assessed as it relates to normal work practice using procedures, information and resources typical of a workplace. This should include:

- OHS policy and work procedures and instructions.
- Suitable work environment, facilities, equipment and materials to undertake actual installation and maintenance of de-energised underground HV polymeric cables.

In addition to the resources listed above, in context of and specific resources for assessment, evidence should show demonstrated competency working below ground, in limited spaces, with different structural/construction types and method and in a variety of environments.

Method of assessment **9.4)**

This Competency Standard Unit shall be assessed by methods given in Volume 1, Part 3 “Assessment Guidelines”.

Note:

Competent performance with inherent safe working practices is expected in the Industry to which this Competency Standard Unit applies. This requires that the specified essential knowledge and associated skills are assessed in a structured environment which is primarily intended for learning/assessment and incorporates all necessary equipment and facilities for learners to develop and demonstrate the essential knowledge and associated skills described in this unit.

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Concurrent assessment and relationship with other units **9.5)**

For optimisation of training and assessment effort, competence in this unit may be assessed concurrently with the following units:

UETTDRCJ26A	Install and maintain de-energised low voltage underground polymeric cables

Range Statement

RANGE STATEMENT

10) This relates to the unit of competency as a whole providing the range of contexts and conditions to which the performance criteria apply. It allows for different work environments and situations that will affect performance.

This Competency Standard Unit shall be demonstrated in relation to the installation and maintenance of de-energised high voltage underground polymeric cables and covers the jointing, terminating, repair and replacement of cables used in systems and circuits and the issuing/accepting of relevant permits.

Underground equipment may include links, fuses, ring main units, distribution fuse boxes, pad mount and ground transformers, chamber substations and busbar/termination boxes.

Test and recording equipment includes voltage detectors, cable identification equipment, cable spiking equipment and insulation resistance testers.

Jointing and terminating materials include compound and resin filled boxes, polymeric tape materials, polymeric heat shrink materials, "slip-on" moulded components and pre-stretched polymeric materials, compression and mechanical connectors

Jointing and terminating locations include circuit breakers, links, fuses, ring main units, distribution fuse boxes, pad mount and ground transformers, chamber substations and busbar/termination boxes.

The following constants and variables included in the element/performance criteria in this unit are fully described in the Definitions Section 1 of this volume and form an integral part of the Range Statement of this unit:

- Appropriate and relevant persons (see Personnel)
- Appropriate authorities
- Appropriate work platform
- Assessing risk

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RANGE STATEMENT

- Assessment
- Authorisation
- Confined space
- Diagnostic, testing and restoration
- Documenting detail work events, record keeping and or storage of information
- Drawings and specifications
- Emergency
- Environmental and sustainable energy procedures
- Environmental legislation
- Environmental management documentation
- Established procedures
- Fall prevention
- Hazards
- Identifying hazards
- Inspect
- Legislation
- MSDS
- Notification.
- OHS practices
- OHS issues
- Permits and/or permits to work
- Personnel
- Quality assurance systems
- Requirements.
- Testing procedures
- Work clearance systems

Unit Sector(s)

Not applicable.

Competency Field

Competency Field **11)**

Cable Jointing

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UETTDRDP12A Maintain overhead energised low voltage conductors and cables

Modification History

Not applicable.

Unit Descriptor

Unit Descriptor **1) Scope:**

1.1) Descriptor

This Competency Standard Unit covers the maintenance of overhead energised low voltage conductors and cables and includes the verification of the site conditions and the potential hazards. It also encompasses the selection of appropriate and authorised work method using specialised equipment, the diagnosis of faults, the undertaking of electrical tests and the updating of system data/maintenance records.

Application of the Unit

Application of the Unit **2)**

This Competency Standard Unit is intended to augment formally acquired competencies. It is suitable for employment-based programs under an approved contract of training.

Licensing/Regulatory Information

License to practice **3)**

The skills and knowledge described in this unit may require a licence/registration to practice in the work place subject to regulations for undertaking of electrical work. Practice in workplace and during training is also subject to regulations directly related to Occupational Health and Safety, electricity/telecommunications/gas/water industry

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License to practice **3)**

safety and compliance, industrial relations, environmental protection, anti discrimination and training. Commonwealth, State/Territory or Local Government legislation and regulations may exist that limits the age of operating certain equipment.

Pre-Requisites

Prerequisite Unit(s) **4)**

Competencies **4.1)**

Granting of competency in this unit shall be made only after competency in the following unit(s) has/have been confirmed.

Where pre-requisite pathways have been identified. All competencies in the Common Unit Group must be have been completed.

Common Unit Group

Unit Code	Unit Title
UEENEEE101A	Apply Occupational Health and Safety regulations, codes and practices in the workplace
UEENEEE102A	Fabricate, assemble and dismantle utilities industry components
UEENEEE104A	Solve problems in d.c. Circuits
UEENEEE105A	Fix and secure electrotechnology equipment
UEENEEE107A	Use drawings, diagrams, schedules, standards, codes and specifications
UEENEEG101A	Solve problems in electromagnetic devices and related circuits
UEENEEG102A	Solve problems in low voltage a.c. Circuits
UETTDREL11A	Apply sustainable energy and

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Prerequisite Unit(s) **4)**

	environmental procedures
UETTDREL12A	Operate plant and equipment near live electrical conductors and apparatus
UETTDREL16A	Working safely near live electrical apparatus
UETTDRIS52A	Install and maintain poles, structures and associated hardware
UETTDRIS54A	Install and maintain poles, structures, overhead conductors and cables

Literacy and numeracy skills **4.2)**

Participants are best equipped to achieve this unit if they have reading, writing and numeracy skills indicated by the following scales. Description of each scale is given in Volume 2, Part 3 “Literacy and Numeracy”

Reading 3 Writing 3 Numeracy 3

Employability Skills Information

Employability Skills **5)**

The required outcomes described in this unit of competency contain applicable facets of Employability Skills. The Employability Skills Summary of the qualification in which this unit of competency is packaged will assist in identifying Employability Skill requirements.

Elements and Performance Criteria Pre-Content

6) Elements describe the essential outcomes of a

Performance Criteria describe the required performance needed to demonstrate achievement of the element.

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competency standard unit	Assessment of performance is to be consistent with the Evidence Guide.

Elements and Performance Criteria

ELEMENT	PERFORMANCE CRITERIA
1 Prepare for the maintenance of overhead energised LV conductors and cables.	1.1 Works schedule(s), including drawings, plans, requirements, established procedures, and material lists, are received, analysed and confirmed, if necessary, by site inspection.
	1.2 Relevant requirements and established procedures for the work are communicated to all personnel and identified for all work sites.
	1.3 OHS policies and procedures related to requirements and established procedures for the maintenance of overhead energised LV conductors and cables are obtained and confirmed for the purposes of the work to be performed and communicated.
	1.4 Physical loads and calculations are confirmed according to requirements, using essential knowledge and appropriate skill.
	1.5 Work is prioritised and sequenced following consultation with others for completion within acceptable timeframes and in accordance with established procedures.
	1.6 Hazards are identified, OHS risks assessed and control measures are prioritised, implemented and monitored including emergency exits kept clear according to established procedures.
	1.7 Relevant work permits are obtained to access and perform work according to requirements and/or established procedures.
	1.8 Resources including personnel, equipment, tools and personal protective equipment required for the job are obtained and confirmed in working order.

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ELEMENT	PERFORMANCE CRITERIA	
	1.9	Specialist equipment for live working is inspected and confined in working order as per requirements and established procedures.
	1.10	Relevant personnel at worksite are confirmed current in First Aid, Pole Top Rescue and other related work procedures according to requirements.
	1.11	Liaison and communication issues with other/authorised personnel, authorities, clients and land owners are resolved to carry out work where necessary.
	1.12	Site is prepared according to the work schedule and to minimise risk and damage to property, commerce, and individuals in accordance with established procedures.
	1.13	Personnel participating in the work, including plant operators and contractors, are fully briefed and respective responsibilities confirmed where applicable in accordance with established procedures.
	1.14	Traffic management plan is identified and implemented.
2 Carry out maintenance of overhead energised LV conductors and cables.	2.1	Environmental principles and practices to reduce the incidents of accidents and minimise waste are monitored and followed in accordance with requirements and/or established procedures.
	2.2	Lifting, climbing, working aloft, and use of power tools/equipment, techniques and practices are safely followed and, currency according to requirements confirmed.
	2.3	Essential knowledge and associated skills are applied in the safe maintenance of overhead energised LV conductors and cables to ensure completion in an agreed timeframe and, to quality standards with a minimum of waste according to requirements.
	2.4	Maintenance, including repair and/or replacement of poles and/or structures is carried out, in

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ELEMENT	PERFORMANCE CRITERIA	
		accordance with the work schedule and requirements/established procedures.
	2.5	Hazard warnings and safety signs are recognised and hazards and assessed OHS risks are reported to the immediate authorised persons for directions according to established procedures.
	2.6	Unplanned events in the maintenance of overhead energised LV conductors and cables are undertaken within the scope of established procedures.
	2.7	Known solutions to a variety of problems are applied using acquired essential knowledge and associated skills.
	2.8	Ongoing checks of quality of the work are undertaken in accordance with instructions and established procedures.
3 Complete the maintenance of overhead energised LV conductors and cables.	3.1	Work undertaken is checked against works schedule for conformance with requirements and anomalies reported in accordance with established procedures.
	3.2	Accidents and/or injuries are reported in accordance with requirements/established procedures, where applicable.
	3.3	Work site is rehabilitated, cleaned up and made safe in accordance with established procedures.
	3.4	Tools, equipment and any surplus resources and materials are, where appropriate, cleaned, checked and returned to storage or disposed of in accordance with established procedures.
	3.5	Relevant work permit(s) are signed off and, overhead energised LV conductors and cables are returned to service in accordance with requirements.
	3.6	Works completion records, reports, as installed /modified drawing and/or documentation and information are finalised and processed and appropriate personnel notified.

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Required Skills and Knowledge

REQUIRED SKILLS AND KNOWLEDGE

8) Essential Knowledge and Associated Skills (EKAS): This describes the essential skills and knowledge and their level, required for this unit.

Evidence shall show that knowledge has been acquired of maintaining overhead energised LV conductors and cables.

All knowledge and skills detailed in this unit should be contextualised to current industry practices and technologies.

KS01-TDP12A Low voltage energised working practices for distribution overhead

Evidence shall show an understanding of the safe working on energised low voltage equipment to an extent indicated by the following aspects:

T1 Standards, codes, Commonwealth, State/Territory/local government legislation, supply authority regulations and or enterprise requirements

T2 Safety precautions specific to working on or near energised low voltage conductors encompassing:

- Safe working practices and procedures
- Identification of hazards, assessment and control of OHS risks
- Types, selection, maintenance and use of personal protective equipment

T3 Work on or near energised LV conductors encompassing:

- Types and function of specialised tools
- Safe working practices when using specialised tools
- Methods of using specialised tools

Evidence Guide

EVIDENCE GUIDE

9) This provides essential advice for assessment of the unit of competency and must be read in conjunction with the performance criteria and the range statement of the unit of competency and the Training Package Assessment Guidelines.

The Evidence Guide forms an integral part of this Competency Standard Unit and shall be used in conjunction with all component parts of this unit and, performed in accordance with the Assessment Guidelines of this Training Package.

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Overview of Assessment **9.1)**

Longitudinal competency development approaches to assessment, such as Profiling, require data to be reliably gathered in a form that can be consistently interpreted over time. This approach is best utilised in Apprenticeship programs and reduces assessment intervention. It is the Industry's preferred model for apprenticeships. However, where summative (or final) assessment is used it is to include the application of the competency in the normal work environment or, at a minimum, the application of the competency in a realistically simulated work environment. It is recognised that, in some circumstances, assessment in part or full can occur outside the workplace. However, it must be in accord with Industry and, Regulatory policy in this regard.

Methods chosen for a particular assessment will be influenced by various factors. These include the extent of the assessment, the most effective locations for the assessment activities to take place, access to physical resources, additional safety measures that may be required and the critical nature of the competencies being assessed.

The critical safety nature of working with electricity, electrical equipment, gas or any other hazardous substance/material carries risk in deeming a person competent. Hence, sources of evidence need to be 'rich' in nature so as to minimise error in judgment.

Activities associated with normal every day work have a bearing on the decision as to how much and how detailed the data gathered will contribute to its 'richness'. Some skills are more critical to safety and operational requirements while the same skills may be more or less frequently practiced. These points are raised for the assessors to consider when choosing an assessment method and developing assessment instruments. Sample assessment instruments are included for Assessors in the Assessment Guidelines of this Training Package.

Critical aspects of evidence required to demonstrate competency in this unit **9.2)**

Before the critical aspects of evidence are considered all prerequisites shall be met.

Evidence for competence in this unit shall be considered

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holistically. Each element and associated performance criteria shall be demonstrated on at least two occasions in accordance with the "Assessment Guidelines – UET12". Evidence shall also comprise:

- A representative body of performance criteria demonstrated within the timeframes typically expected of the discipline, work function and industrial environment. In particular this shall incorporate evidence that shows a candidate is able to:
  - Implement Occupational Health and Safety workplace procedures and practices including the use of risk control measures as specified in the performance criteria and range; and
  - Apply sustainable energy principles and practices as specified in the performance criteria and range; and
  - Demonstrate an understanding of the essential knowledge and associated skills as described in this unit to such an extent that the learner's performance outcome is reported in accordance with the preferred approach; namely a percentile graded result, where required by the regulated environment; and
  - Demonstrate an appropriate level of employability skills; and
- Conduct work observing the relevant Anti Discrimination legislation, regulations, policies and workplace procedures; and
  - Demonstrated performance across a representative range of contexts from the prescribed items below:

Range of tools/equipment/materials/procedures/workplaces/other variables		
Group No	**The minimum number of items on which skill is to be demonstrated**	**Item List**
A	At least two of the following:	Copper Aluminium Aluminium/steel reinforced Steel Pilot
B	At least two of the	EWP

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	following:	Ladder Portable platform
C	All of the following:	Insulating mats/sleeves Temporary bridging device Insulating gloves Insulated cable tensioning devices Ladder/pole shrouds Equipotential bonding
D	At least three of the following:	Voltage detector* Clamp-on ammeter Polarity tester Insulation resistance tester Phase sequence indicator Recording meters (*must do)
E	At least one occasion	Dealing with an unplanned event by drawing on essential knowledge and associated skills to provide appropriate solutions incorporated in the holistic assessment with the above listed items.

Context of and specific resources for assessment **9.3)**

This unit should be assessed as it relates to normal work practice using procedures, information and resources typical of a workplace. This should include:

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- OHS policy and work procedures and instructions.
- Suitable work environment, facilities, equipment and materials to undertake actual maintenance of overhead energised LV conductors and cables

In addition to the resources listed above, in Context of and specific resources for assessment, evidence should show demonstrated competency working below ground, in limited spaces, with different structural/construction types and method and in a variety of environments.

Method of assessment

9.4)

This Competency Standard Unit shall be assessed by methods given in Volume 1, Part 3 “Assessment Guidelines”.

Note:

Competent performance with inherent safe working practices is expected in the Industry to which this Competency Standard Unit applies. This requires that the specified essential knowledge and associated skills are assessed in a structured environment which is primarily intended for learning/assessment and incorporates all necessary equipment and facilities for learners to develop and demonstrate the essential knowledge and associated skills described in this unit.

Concurrent assessment and relationship with other units

9.5)

There are no recommended concurrencies for this unit.

Range Statement

RANGE STATEMENT

10) This relates to the unit of competency as a whole providing the range of contexts and conditions to which the performance criteria apply. It allows for different work environments and situations that will affect performance.

This Competency Standard Unit shall be demonstrated in relation to the maintenance of overhead energised low voltage conductors and cables taking into account the

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RANGE STATEMENT

potential hazards, the calculation of physical loads, including an understanding of the effects of traffic loads and de-rating of circuits.

Maintenance may include the removal, repair and replacement of cables, conductors and associated hardware.

Structures include poles, and columns.

Work methods require the use of insulating gloves and specialised live working equipment and tools.

Work may be performed from elevating work platform, ladder, portable pole platform, or the ground.

Testing and recording devices include voltage detectors, tong ammeters, polarity testers, recording meters and phase sequence indicators.

Specialised live working equipment includes insulating mats and sleeves, insulating gloves, temporary bridges/hoppers, insulated cable tensioning devices and ladder/pole shrouds and equipotential bonding.

The following constants and variables included in the element/performance criteria in this unit are fully described in the Definitions Section 1 of this volume and form an integral part of the Range Statement of this unit:

- Appropriate and relevant persons (see Personnel)
- Appropriate authorities
- Appropriate work platform
- Assessing risk
- Assessment
- Authorisation
- Diagnostic, testing and restoration
- Documenting detail work events, record keeping and or storage of information
- Drawings and specifications
- Emergency
- Environmental and sustainable energy procedures
- Environmental legislation
- Environmental management documentation
- Established procedures
- Fall prevention
- Hazards
- Identifying hazards
- Inspect
- Legislation
- MSDS

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RANGE STATEMENT

- Notification
- OHS practices
- OHS issues
- Permits and/or permits to work
- Personnel
- Quality assurance systems
- Requirements.
- Testing procedures
- Work clearance systems

Unit Sector(s)

Not applicable.

Competency Field

Competency Field **11)**

Distribution

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UETTDREL11A Apply sustainable energy and environmental procedures

Modification History

Not applicable.

Unit Descriptor

Unit Descriptor **1) Scope:**

1.1) Descriptor

This Competency Standard Unit covers the implementation of relevant environmental procedures to specific projects/sites. It includes the identification of possible environmental risks and impacts, the undertaking of work in accordance with sustainable energy and energy conservation principles, the provision of re-cycling materials and the recording and reporting of environmental incidents. It also encompasses the process of reviewing and participating and contributing in environmental procedures according to established enterprise requirements.

Application of the Unit

Application of the Unit **2)**

This Competency Standard Unit is intended to augment formally acquired competencies. It is suitable for employment-based programs under an approved contract of training.

Licensing/Regulatory Information

License to practice **3)**

The skills and knowledge described in this unit may require a licence/registration to practice in the work place subject to regulations for undertaking of electrical work.

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License to practice **3)**

Practice in workplace and during training is also subject to regulations directly related to Occupational Health and Safety, electricity/telecommunications/gas/water industry safety and compliance, industrial relations, environmental protection, anti discrimination and training. Commonwealth, State/Territory or Local Government legislation and regulations may exist that limits the age of operating certain equipment.

Pre-Requisites

Prerequisite Unit(s) **4)**

Competencies **4.1)**

Granting of competency in this unit shall be made only after competency in the following unit(s) has/have been confirmed.

Where pre-requisite pathways have been identified. All competencies in the Common Unit Group must be have been completed plus all the competencies in one (1) of the identified Pathway Unit Group(s):

There are no prerequisite competencies to this unit.

Literacy and numeracy skills **4.2)**

Participants are best equipped to achieve this unit if they have reading, writing and numeracy skills indicated by the following scales. Description of each scale is given in Volume 2, Part 3 “Literacy and Numeracy”.

Reading 3 Writing 3 Numeracy 3

Employability Skills Information

Employability Skills **5)**

The required outcomes described in this unit of

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Employability Skills	**5)** competency contain applicable facets of Employability Skills. The Employability Skills Summary of the qualification in which this unit of competency is packaged will assist in identifying Employability Skill requirements.

Elements and Performance Criteria Pre-Content

6) Elements describe the essential outcomes of a competency standard unit	Performance Criteria describe the required performance needed to demonstrate achievement of the element. Assessment of performance is to be consistent with the Evidence Guide.

Elements and Performance Criteria

ELEMENT	PERFORMANCE CRITERIA
1 Prepare to implement environmental and sustainable energy procedures	1.1 Works schedule(s), including drawings, plans, requirements, established procedures, and material lists, are received, analysed and confirmed, if necessary, by site inspection.
	1.2 Relevant requirements and established procedures for the work are communicated to all personnel and identified for all work sites.
	1.3 OHS policies and procedures related to requirements and established procedures for the implementation of environmental and sustainable energy procedures are obtained and confirmed for the purposes of the work to be performed and communicated.
	1.4 Environmental and sustainable energy procedures are identified, prioritised and combined within relevant projects, following consultation with others for completion within acceptable timeframes and in accordance with established procedures.
	1.5 Hazards are identified, OHS risks assessed and control measures are prioritised, implemented and monitored including emergency exits kept

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ELEMENT	PERFORMANCE CRITERIA	
		clear according to established procedures.
	1.6	Relevant work permits are obtained to access and perform work according to environmental and sustainable energy procedures, requirements and/or established procedures.
	1.7	Resources including personnel, equipment, tools and personal protective equipment required for the job are obtained and confirmed in working order.
	1.8	Relevant personnel at worksite are confirmed current in environmental and sustainable energy procedures and other related work procedures according to requirements.
	1.9	Liaison and communication issues with other/authorised personnel, authorities, clients and land owners are resolved to carry out work where necessary.
	1.10	Site is prepared according to the work schedule, taking into account environmental and sustainable energy procedures and the need to minimise risk and damage to property, commerce, and individuals in accordance with established procedures.
	1.11	Personnel participating in the work, including plant operators and contractors, are fully briefed on environmental and sustainable energy procedures and respective responsibilities confirmed where applicable in accordance with established procedures.
2 Carry out environmental and sustainable energy procedures	2.1	OHS and sustainable energy principles and practices to reduce the incidents of accidents and minimise waste are monitored and followed in accordance with requirements and/or established procedures.
	2.2	Use of power tools/equipment, techniques and practices are safely followed under environmental and sustainable energy procedures and, currency according to requirements confirmed.

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ELEMENT	PERFORMANCE CRITERIA	
	2.3	Essential knowledge and associated skills are applied in the safe implementation of environmental and sustainable energy procedures to ensure completion in an agreed timeframe and, to quality standards with a minimum of waste according to requirements.
	2.4	Relevant environmental procedures are applied to a specific project(s)/site(s).
	2.5	Work is conducted in accordance with the principles of sustainable energy and energy conservation.
	2.6	Provision for the re-cycling or re-use of materials is undertaken where possible.
	2.7	Hazard warnings and safety signs are recognised and hazards and assessed OHS risks are reported to the immediate authorised persons for directions according to established procedures.
	2.8	Unplanned events in the implementation of environmental and sustainable energy procedures are undertaken within the scope of established procedures.
	2.9	Known solutions to a variety of problems are applied using acquired essential knowledge and associated skills on environmental and sustainable energy procedures.
	2.10	Ongoing checks of quality of the work are undertaken in accordance with instructions and established procedures.
3 Complete the environmental and sustainable energy procedures	3.1	Work undertaken is checked against works schedule for conformance with requirements and environmental and sustainable energy procedures and, anomalies reported in accordance with established procedures.
	3.2	Accidents and/or injuries are reported in accordance with requirements/established procedures, where applicable.
	3.3	Work site is rehabilitated, cleaned up and made

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ELEMENT	PERFORMANCE CRITERIA	
		safe in accordance with environmental and sustainable energy procedures as well as other established procedures.
	3.4	Tools, equipment and any surplus resources and materials are, where appropriate, cleaned, checked and returned to storage in accordance with environmental and sustainable energy procedures as well as other established procedures.
	3.5	Relevant work permit(s) are signed off and, environmental risks/incidents and potential impacts are reported and recorded according to requirements/established procedures.
	3.6	Works completion records, reports, as installed /modified drawing and/or documentation and information are finalised and processed and appropriate personnel notified.

Required Skills and Knowledge

REQUIRED SKILLS AND KNOWLEDGE

8) Essential Knowledge and Associated Skills (EKAS): This describes the essential skills and knowledge and their level, required for this unit.

Evidence shall show that knowledge has been acquired of applying environmental and sustainable energy procedures.

All knowledge and skills detailed in this unit should be contextualised to current industry practices and technologies.

KS01-TEL11A Environmental fundamentals

Evidence shall show an understanding of environmental fundamentals to an extent indicated by the following aspects:

T1 Environmental standards, codes, environmental legislation, supply authority regulations and or enterprise requirements applicable to the control of environment associated with the worksite encompassing:

- Relevant federal legislation
- Relevant state/territory legislation
- Relevant local government by-laws
- Relevant government or quasi government policies and regulations

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REQUIRED SKILLS AND KNOWLEDGE

- Relevant community planning and development agreements - land care agreements

T2 Employer and employee responsibilities

T3 Methods of obtaining information on environmental issues and updates

T4 Methods of identifying environmental impacts from work related activities

T5 Meaning of environmental terms encompassing:

- Identification, assessment and control of risks
- Compliance
- Best practice
- Sustainable energy

T6 Procedures in implementing management plans to ensure compliance

KS02-TEL11A Material handling and the environment

Evidence shall show an understanding of material handling and the environment to an extent indicated by the following aspects:

T1 Methods of obtaining updated environmental information and data sheets on the proper use and handling of equipment and materials

T2 Environmental standards, codes, environmental legislation, OHS legislation, hazardous substances/dangerous goods regulations, supply authority regulations and or enterprise requirements applicable environmental care when handling materials including provision of manufacturers and suppliers information such as material safety data sheets (MSDS)

T3 Types and application of personal protective equipment used for hazards substances and dangerous goods

T4 Techniques in handling equipment to eliminate/reduce risks to the environment from spillages of oils, herbicides, pesticides and chemicals from such equipment encompassing:

- Vehicle loading crane
- Chainsaw
- Enterprise vehicles
- Explosive power tools

T5 Procedures for handling and control of spillages of herbicides

T6 Methods of disposing and storage of herbicides, pesticides, oils and chemicals

T7 Methods of cleaning mobile plant, equipment and tools

T8 Emergency procedures for spillages of oil to reduce risks to the environment encompassing:

- Methods of cleaning up excessive spillages
- Methods of protection to surrounding environment

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REQUIRED SKILLS AND KNOWLEDGE

- Procedure for notification of relevant personnel and authorities
- Recording procedures

T9 Recording of data

Evidence Guide

EVIDENCE GUIDE

9) This provides essential advice for assessment of the competency standard unit and must be read in conjunction with the Performance Criteria and the range statement of the competency standard unit and the Training Package Assessment Guidelines.

The Evidence Guide forms an integral part of this Unit and shall be used in conjunction with all component parts of this unit and, performed in accordance with the Assessment Guidelines of this Training Package.

Overview of Assessment **9.1)**

Longitudinal competency development approaches to assessment, such as Profiling, require data to be reliably gathered in a form that can be consistently interpreted over time. This approach is best utilised in Apprenticeship programs and reduces assessment intervention. It is the Industry's preferred model for apprenticeships. However, where summative (or final) assessment is used it is to include the application of the competency in the normal work environment or, at a minimum, the application of the competency in a realistically simulated work environment. It is recognised that, in some circumstances, assessment in part or full can occur outside the workplace. However, it must be in accord with Industry and, Regulatory policy in this regard.

Methods chosen for a particular assessment will be influenced by various factors. These include the extent of the assessment, the most effective locations for the assessment activities to take place, access to physical resources, additional safety measures that may be required and the critical nature of the competencies being assessed.

The critical safety nature of working with electricity, electrical equipment, gas or any other hazardous substance/material carries risk in deeming a person competent. Hence, sources of evidence need to be 'rich' in nature so as to minimise error in judgment.

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Activities associated with normal every day work have a bearing on the decision as to how much and how detailed the data gathered will contribute to its 'richness'. Some skills are more critical to safety and operational requirements while the same skills may be more or less frequently practiced. These points are raised for the assessors to consider when choosing an assessment method and developing assessment instruments. Sample assessment instruments are included for Assessors in the Assessment Guidelines of this Training Package.

Critical aspects of evidence required to demonstrate competency in this unit

9.2)

Before the critical aspects of evidence are considered all prerequisites shall be met.

Evidence for competence in this unit shall be considered holistically. Each element and associated Performance Criteria shall be demonstrated on at least two occasions in accordance with the "Assessment Guidelines – UET12". Evidence shall also comprise:

- A representative body of Performance Criteria demonstrated within the timeframes typically expected of the discipline, work function and industrial environment. In particular this shall incorporate evidence that shows a candidate is able to:
  - Implement Occupational Health and Safety workplace procedures and practices including the use of risk control measures as specified in the Performance Criteria and range; and
  - Apply sustainable energy principles and practices as specified in the Performance Criteria and range; and
  - Demonstrate an understanding of the essential knowledge and associated skills as described in this unit to such an extent that the learner's performance outcome is reported in accordance with the preferred approach; namely a percentile graded result, where required by the regulated environment; and
  - Demonstrate an appropriate level of employability skills; and
- Conduct work observing the relevant Anti Discrimination legislation, regulations, policies and workplace procedures;

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and

- Demonstrated performance across a representative range of contexts from the prescribed items below:

Range of tools/equipment/materials/procedures/workplaces/other variables		
Group No	**The minimum number of items on which skill is to be demonstrated**	**Item List**
A	All of the following:	Environmental risk assessment Legislative requirements Sustainable energy principles and practice
B	At least one occasion	Dealing with an unplanned event by drawing on essential knowledge and associated skills to provide appropriate solutions incorporated in the holistic assessment with the above listed items.

Context of and specific resources for assessment

9.3)

This unit should be assessed as it relates to normal work practice using procedures, information and resources typical of a workplace. This should include:

- OHS policy and work procedures and instructions.
- Suitable work environment, facilities, equipment and materials to undertake actual environmental and sustainable energy procedures.

In addition to the resources listed above, in context of and specific resources for assessment, evidence should show demonstrated

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competency working below ground, in limited spaces, with different structural/construction types and method and in a variety of environments.

Method of assessment **9.4)**

This Competency Standard Unit shall be assessed by methods given in Volume 1, Part 3 "Assessment Guidelines".

Note:
Competent performance with inherent safe working practices is expected in the Industry to which this Competency Standard Unit applies. This requires that the specified essential knowledge and associated skills are assessed in a structured environment which is primarily intended for learning/assessment and incorporates all necessary equipment and facilities for learners to develop and demonstrate the essential knowledge and associated skills described in this unit.

Concurrent assessment and relationship with other units **9.5)**

For optimisation of training and assessment effort, competence in this unit may be assessed concurrently with the following units:

UEENEEE101A Apply Occupational Health Safety regulations, codes and practices in the workplace

UETTDREL12A Operate plant and equipment near live electrical conductors and apparatus

UETTDREL14A Working safe near live electrical apparatus as a non-electrical worker

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Range Statement

RANGE STATEMENT

10) This relates to the competency standard unit as a whole providing the range of contexts and conditions to which the Performance Criteria apply. It allows for different work environments and situations that will affect performance.

This Unit shall be demonstrated in relation to the application of relevant environmental and sustainable energy procedures to specific projects/sites incorporating energy conservation principles and relevant re-cycling procedures.

Specific project(s)/site(s) may include, but is not limited to buildings; plants construction and maintenance sites; workshops; laboratories; catchments; flood plains irrigation sites; wetlands; drainage sites; waste disposal sites; easements.

Environmental risks may include impact of mismanagement of chemicals; impact of mismanagement of biological agents; detrimental impact on limited water resources; spillage; waste disposal; detrimental impact on water catchment areas (urban and non-urban); detrimental impact on rivers, waterways and channels; unsatisfactory trade waste treatment and disposal processes; poor construction processes; planning deficiencies; neglect of sustainable energy principles

Environmental legislation may include relevant federal legislation; relevant State/Territory legislation; relevant local government by-laws; relevant government or quasi government policies and regulations; relevant community planning and development agreements (e.g. land care agreements)

Incidents of environmental impact may include emissions to air; releases to/of water; releases to land; vibration and noise; disposal of waste; contamination of land; impact on communities; destruction of habitat; use of energy sources; waste generation processes and technologies; impact on culturally significant sites; and may involve the implementation of emergency responses

Environmental management documentation may include information on applicable environmental laws or other requirements; complaint records; training records; process information; process operational log books; inspection, maintenance and calibration records; relevant contractor and supplier information; incident reports; information on emergency preparedness and response; records of significant environmental impacts; chain of custody and compliance records; audit results; management reviews

The following constants and variables included in the element/Performance Criteria in this unit are fully described in the Definitions Section 1 of this volume and form an integral part of the Range Statement of this unit:

- Appropriate and relevant persons (see Personnel)
- Appropriate authorities
- Assessing risk
- Assessment
- Authorisation
- Diagnostic, testing and restoration

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RANGE STATEMENT

- Documenting detail work events, record keeping and or storage of information
- Drawings and specifications
- Emergency
- Environmental and sustainable energy procedures
- Environmental legislation
- Environmental management documentation
- Established procedures
- Fall prevention
- Hazards
- Identifying hazards
- Inspect
- Legislation
- MSDS
- Notification
- OHS practices
- OHS issues
- Permits and/or permits to work
- Personnel
- Quality assurance systems
- Requirements
- Testing procedures
- Work clearance systems

Unit Sector(s)

Not applicable.

Competency Field

Competency Field **11)**

Entry Level – Cross Discipline Units.

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UETTDREL12A Operate plant and equipment near live electrical conductors and apparatus

Modification History

Not applicable.

Unit Descriptor

Unit Descriptor **1) Scope:**

1.1) Descriptor

This Competency Standard Unit covers the safe operation of plant and equipment near live electrical conductors and/or apparatus. It encompasses plant and equipment relevant to the enterprise and is in addition to any Commonwealth, State/Territory or Local Government legislation and or regulatory requirements regarding the operation of that plant and or equipment. It includes maintenance the conducting of operational checks, the correct positioning of road signs, barriers and or warning devices. It also encompasses the completion of log books and job completion documentation.

Application of the Unit

Application of the Unit **2)**

This Competency Standard Unit is intended to augment formally acquired competencies. It is suitable for employment-based programs under an approved contract of training.

Licensing/Regulatory Information

License to practice **3)**

The skills and knowledge described in this unit may require a licence/registration to practice in the work place subject to regulations for undertaking of electrical work.

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License to practice **3)**

Practice in workplace and during training is also subject to regulations directly related to Occupational Health and Safety, electricity/telecommunications/gas/water industry safety and compliance, industrial relations, environmental protection, anti discrimination and training. Commonwealth, State/Territory or Local Government legislation and regulations may exist that limits the age of operating certain equipment.

Pre-Requisites

Prerequisite Unit(s) **4)**

Competencies **4.1)**

Granting of competency in this unit shall be made only after competency in the following unit(s) has/have been confirmed.

Where pre-requisite pathways have been identified. All competencies in the Common Unit Group must be have been completed.

Common Unit Group

Unit Code	Unit Title
UEENEEE101A	Apply Occupational Health and Safety regulations, codes and practices in the workplace
UEENEEE107A	Use drawings, diagrams, schedules, standards, codes and specifications
UETTDREL16A	Working safely near live electrical apparatus

Literacy and numeracy skills **4.2)**

Participants are best equipped to achieve this unit if they have reading, writing and numeracy skills indicated by the following scales. Description of each scale is given in

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Volume 2, Part 3 “Literacy and Numeracy”.

Reading 3 Writing 3 Numeracy 3

Employability Skills Information

Employability Skills **5)**

The required outcomes described in this unit of competency contain applicable facets of Employability Skills. The Employability Skills Summary of the qualification in which this unit of competency is packaged will assist in identifying Employability Skill requirements.

Elements and Performance Criteria Pre-Content

6) Elements describe the essential outcomes of a competency standard unit

Performance Criteria describe the required performance needed to demonstrate achievement of the element. Assessment of performance is to be consistent with the Evidence Guide.

Elements and Performance Criteria

ELEMENT	PERFORMANCE CRITERIA
1 Prepare to operate plant and equipment near energised and exposed electrical conductors/apparatus	1.1 Works schedule(s), including drawings, plans, requirements, established procedures, and material lists, are received, analysed and confirmed, if necessary, by site inspection.
	1.2 Relevant requirements and established procedures for the operation of plant and equipment near energised and exposed electrical conductors/apparatus are communicated to all personnel and identified for all work sites.
	1.3 OHS policies and procedures related to requirements and established procedures for the operation of plant and equipment near energised

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ELEMENT	PERFORMANCE CRITERIA	
		and exposed electrical conductors/apparatus are obtained and confirmed for the purposes of the work to be performed and communicated.
	1.4	Work is prioritised and sequenced following consultation with others for completion within acceptable timeframes and in accordance with established procedures.
	1.5	Hazards are identified, OHS risks assessed and control measures are prioritised, implemented and monitored including emergency exits kept clear according to established procedures.
	1.6	Relevant work permits are obtained to access and perform work according to requirements and/or established procedures.
	1.7	Resources including personnel, equipment, tools and personal protective equipment required for the job are obtained and confirmed in working order.
	1.8	Relevant personnel at worksite are confirmed current in First Aid, relevant rescue procedures and other related work procedures according to requirements.
	1.9	Liaison and communication issues with other/authorised personnel, authorities, clients and land owners are resolved to carry out work where necessary.
	1.10	Site is prepared according to the work schedule and to minimise risk and damage to property, commerce, and individuals in accordance with established procedures.
	1.11	Personnel participating in the work, including plant operators and contractors, are fully briefed and respective responsibilities confirmed where applicable in accordance with established procedures.
	1.12	Road signs, barriers and warning devices are positioned in accordance with requirements.

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ELEMENT	PERFORMANCE CRITERIA
2 Carry out the operation of plant and equipment near energised and exposed electrical conductors/apparatus	2.1 OHS and sustainable energy principles and practices to reduce the incidents of accidents and minimise waste are monitored and followed in accordance with requirements and/or established procedures.
	2.2 Lifting, climbing, working in confined spaces and aloft, and use of power tools/equipment, techniques and practices are safely followed and, currency according to requirements confirmed.
	2.3 Essential knowledge and associated skills are applied in the safe operation of plant and equipment near energised and exposed electrical conductors/apparatus to ensure completion in an agreed timeframe and, to quality standards with a minimum of waste according to requirements.
	2.4 Plant and equipment are safely operated near energised and exposed electrical conductors/apparatus according to requirements and established procedures.
	2.5 Hazard warnings and safety signs are recognised and hazards and assessed OHS risks are reported to the immediate authorised persons for directions according to established procedures.
	2.6 Unplanned events in the operation of plant and equipment near energised and exposed electrical conductors/apparatus are undertaken within the scope of established procedures.
	2.7 Known solutions to a variety of problems are applied using acquired essential knowledge and associated skills.
	2.8 Ongoing checks of quality of the work are undertaken in accordance with instructions and established procedures.
3 Complete the operation of plant and equipment near	3.1 Work undertaken is checked against works schedule for conformance with requirements and anomalies reported in accordance with

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ELEMENT	PERFORMANCE CRITERIA	
energised and exposed electrical conductors/apparatus		established procedures.
	3.2	Accidents and/or injuries are reported in accordance with requirements/established procedures, where applicable.
	3.3	Work site is rehabilitated, cleaned up and made safe in accordance with established procedures.
	3.4	Tools, equipment and any surplus resources and materials are, where appropriate, cleaned, checked and returned to storage in accordance with established procedures.
	3.5	Relevant work permit(s) are signed off and, plant and equipment are checked, returned to service/stored appropriately, in accordance with requirements and established procedures.
	3.6	Works completion records, reports, as installed /modified drawing and/or documentation and information are finalised and processed and appropriate personnel notified.

Required Skills and Knowledge

REQUIRED SKILLS AND KNOWLEDGE

8) Essential Knowledge and Associated Skills (EKAS): This describes the essential skills and knowledge and their level, required for this unit.

Evidence shall show that knowledge has been acquired of operating plant and equipment near live electrical conductors/apparatus.

All knowledge and skills detailed in this unit should be contextualised to current industry practices and technologies.

KS01-TEL12A Chain saw principles

Evidence shall show an understanding of requirements for the use of chain saws including relevant certification and licensing (if required) to an extent indicated by the following aspects:

T1 Safety precautions, requirements and responsibilities

T2 Selection and use of appropriate personal protective equipment

T3 Chain saw operation encompassing:

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REQUIRED SKILLS AND KNOWLEDGE

- Parts and function of components and ancillary equipment
- Pre-operational checks
- Starting procedures
- Safe use of chain saw under load
- Safe transporting and storage procedures

KS02-TEL12A Elevating work platform operational principles

Evidence shall show an understanding of operation of elevating work platform (EWP) to an extent indicated by the following aspects:

T1 Standards, codes, legislation, supply authority regulations and or enterprise requirements associated with EWP including relevant certification and licensing encompassing:

- Safe working clearances
- Safe operation procedures and the mandatory wearing of harness/attachment requirements
- Safety observers
- Inspection and testing procedures prior to use
- Set-up, operate and shut down procedures for an EWP

T2 Emergency procedures for an EWP encompassing:

- Escape procedures for an EWP
- Rescuing procedures
- Mechanical failure procedures

T3 Types of EWPs insulated/uninsulated

KS03-TEL12A Enterprise vehicles

Evidence shall show an understanding of requirements for the use of enterprise vehicles such as, trucks and four wheel drives to an extent indicated by the following aspects:

T1 Standards, codes, legislation, supply authority regulations and or enterprise requirements associated with safe use of enterprise vehicles including relevant certification and licensing such as encompassing:

- Motor cars
- Light and heavy commercial trucks
- Heavy truck/trailer combination
- Four wheel drive vehicles

T2 Compliance with regulations associated with the securing of loads prior for transportation

KS04-TEL12A Hydraulic and pneumatic portable equipment

Evidence shall show an understanding of operation and maintenance of mobile plant, tools and equipment to an extent indicated by the following aspects:

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REQUIRED SKILLS AND KNOWLEDGE

T1 Standards, codes, legislation, supply authority regulations and or enterprise requirements associated with portable hydraulic equipment and portable pneumatic equipment, including relevant certification and licensing encompassing:

- Safe working clearances
- Safe operation procedures
- Safety observers

T2 Inspection and testing procedures prior to use

T3 Set-up, operate and shut down procedures

T4 Permit to work systems and isolation procedures

KS05-TEL12A Basic rigging techniques

Evidence shall show an understanding of basic rigging techniques to an extent indicated by the following aspects:

T1 Standards, codes, legislation, supply authority regulations and or enterprise requirements associated with rigging including the operation of cranes, hoists and winches and relevant certification and licensing (if required)

T2 Requirements for the use of enterprise construction manuals, system diagrams/plans and drawings

T3 Safe use of rigging equipment, tools and associated equipment encompassing:

- Types, techniques and application
- Site inspection procedures encompassing:
- Identifying hazards, assessing and controlling risks
- Appropriate sequence of loading and unloading

T4 Determining the mass and dimensions of load

T5 Selection and inspection procedures encompassing:

- Rigging equipment, materials and tools
- Note: Examples include natural and synthetic fibre ropes and chains, fittings, winch and capstan
- Ratings of wire ropes and slings
- Removing, repairing and replacing of damage parts

T6 Techniques for assembling and erecting power winches and capstans

T7 Checking the integrity of support structure; visual inspection of load connections

T8 Techniques in moving, lifting, shifting, managing and placing loads encompassing:

- Use of appropriate communication and signalling methods
- Codes of practice/compliance
- Enterprise and Commonwealth, State/Territory legislative requirements

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REQUIRED SKILLS AND KNOWLEDGE

- Weather conditions
- Erection of safety nets and lines
- Methods of fixing and anchoring loads
- Load stability

Evidence Guide

EVIDENCE GUIDE

9) This provides essential advice for assessment of the competency standard unit and must be read in conjunction with the Performance Criteria and the range statement of the competency standard unit and the Training Package Assessment Guidelines.

The Evidence Guide forms an integral part of this Competency Standard Unit and shall be used in conjunction with all component parts of this unit and, performed in accordance with the Assessment Guidelines of this Training Package.

Overview of Assessment **9.1)**

Longitudinal competency development approaches to assessment, such as Profiling, require data to be reliably gathered in a form that can be consistently interpreted over time. This approach is best utilised in Apprenticeship programs and reduces assessment intervention. It is the Industry's preferred model for apprenticeships. However, where summative (or final) assessment is used it is to include the application of the competency in the normal work environment or, at a minimum, the application of the competency in a realistically simulated work environment. It is recognised that, in some circumstances, assessment in part or full can occur outside the workplace. However, it must be in accord with Industry and, Regulatory policy in this regard.

Methods chosen for a particular assessment will be influenced by various factors. These include the extent of the assessment, the most effective locations for the assessment activities to take place, access to physical resources, additional safety measures that may be required and the critical nature of the competencies being assessed.

The critical safety nature of working with electricity, electrical equipment, gas or any other hazardous substance/material carries risk in deeming a person competent. Hence, sources of evidence

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need to be 'rich' in nature so as to minimise error in judgment.

Activities associated with normal every day work have a bearing on the decision as to how much and how detailed the data gathered will contribute to its 'richness'. Some skills are more critical to safety and operational requirements while the same skills may be more or less frequently practiced. These points are raised for the assessors to consider when choosing an assessment method and developing assessment instruments. Sample assessment instruments are included for Assessors in the Assessment Guidelines of this Training Package.

Critical aspects of evidence required to demonstrate competency in this unit

9.2)

Before the critical aspects of evidence are considered all prerequisites shall be met.

Evidence for competence in this unit shall be considered holistically. Each element and associated Performance Criteria shall be demonstrated on at least two occasions in accordance with the "Assessment Guidelines – UET12". Evidence shall also comprise:

- A representative body of Performance Criteria demonstrated within the timeframes typically expected of the discipline, work function and industrial environment. In particular this shall incorporate evidence that shows a candidate is able to:
  - Implement Occupational Health and Safety workplace procedures and practices including the use of risk control measures as specified in the Performance Criteria and range; and
  - Apply sustainable energy principles and practices as specified in the Performance Criteria and range; and
  - Demonstrate an understanding of the essential knowledge and associated skills as described in this unit to such an extent that the learner's performance outcome is reported in accordance with the preferred approach; namely a percentile graded result, where required by the regulated environment; and
  - Demonstrate an appropriate level of employability skills; and
- Conduct work observing the relevant Anti Discrimination

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legislation, regulations, policies and workplace procedures; and

- Demonstrated performance across a representative range of contexts from the prescribed items below:

Range of tools/equipment/materials/procedures/workplaces/other variables		
Group No	**The minimum number of items on which skill is to be demonstrated**	**Item List**
A	At least four of the following:	Portable generators Chain-saws Concrete cutters Jack hammers Welders Compressor Crimper-cutters Pumps Post hole diggers Drills Friction grip winches Pullers Block and tackle
B	At least one of the following:	Elevating work platform Back hoes Self loading vehicle Borer Bobcat Trench excavators Heavy vehicles
C	At least one occasion	Dealing with an unplanned event by drawing on essential knowledge and

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		associated skills to provide appropriate solutions incorporated in the holistic assessment with the above listed items. Note Refer to Section 2.1 Licence to practice contained in this unit for information relevant to the use of the above equipment.

Context of and specific resources for assessment **9.3)**

This unit should be assessed as it relates to normal work practice using procedures, information and resources typical of a workplace. This should include:

- OHS policy and work procedures and instructions.
- Suitable work environment, facilities, equipment and materials to undertake actual operation of plant and equipment near live conductors and or apparatus.

In addition to the resources listed above, in context of and specific resources for assessment, evidence should show demonstrated competency working below ground, in limited spaces, with different structural/construction types and method and in a variety of environments.

Method of assessment **9.4)**

This Competency Standard Unit shall be assessed by methods given in Volume 1, Part 3 “Assessment Guidelines”.

Note:

Competent performance with inherent safe working practices is expected in the Industry to which this Competency Standard Unit applies. This requires that the specified essential knowledge and associated skills are assessed in a structured environment which is primarily intended for learning/assessment and incorporates all

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necessary equipment and facilities for learners to develop and demonstrate the essential knowledge and associated skills described in this unit.

Concurrent assessment and relationship with other units

9.5)

For optimisation of training and assessment effort, competence in this unit may be assessed concurrently with the following units:

UETTDREL13A	Comply with sustainability, environmental and incidental response policies and procedures
UEENEEE101A	Apply Occupational Health Safety regulations, codes and practices in the workplace

Range Statement

RANGE STATEMENT

10) This relates to the competency standard unit as a whole providing the range of contexts and conditions to which the Performance Criteria apply. It allows for different work environments and situations that will affect performance.

This Competency Standard Unit shall be demonstrated in relation to the operation of plant and equipment near live electrical conductors and/or apparatus.

Support plant may include elevating work platform, back hoes, earth drilling rigs, trench excavators, heavy vehicles, concrete cutters, compressors, portable generators, welders, crimper-cutters, pumps, chain-saws, jack-hammers, post hole diggers, sand-blasters, drills and self loading vehicle.

Equipment may include hand operated ratchet and friction grip winches, chain pullers and block and tackle.

The following constants and variables included in the element/Performance Criteria in this unit are fully described in the Definitions Section 1 of this volume and form an integral part of the Range Statement of this unit:

- Appropriate and relevant persons (see Personnel)
- Appropriate authorities
- Appropriate work platform
- Assessing risk
- Assessment

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RANGE STATEMENT

- Authorisation
- Confined space
- Documenting detail work events, record keeping and or storage of information
- Drawings and specifications
- Emergency
- Environmental and sustainable energy procedures
- Environmental legislation
- Environmental management documentation
- Established procedures
- Fall prevention
- Hazards
- Identifying hazards
- Inspect
- Legislation
- MSDS
- Notification
- OHS practices
- OHS issues
- Permits and/or permits to work
- Personnel
- Quality assurance systems
- Requirements
- Testing procedures
- Work clearance systems

Unit Sector(s)

Not applicable.

Competency Field

Competency Field **11)**

Entry Level –Cross Discipline Units.

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UETTDREL16A Working safely near live electrical apparatus

Modification History

Not applicable.

Unit Descriptor

Unit Descriptor **1) Scope:**

1.1) Descriptor

This Competency Standard Unit covers compliance with working safely up to the defined "safe approach distance" near energised electrical apparatus (inc. electrical powerlines) for electrical worker. It includes work functions that may be performed, such as vegetation control, scaffolding, rigging, painting, and/or any other activity that requires working safely and complying with requirements and/or established procedures near live electrical apparatus by an electrical worker. Also included is the preparation of risk assessment control measures that encompass job safety assessment. It does not include any work that is or may be performed by other competent operatives within the defined "safe working zone". The defined "safe working zone" is that so defined by relevant State or Territory regulatory agencies/bodies, local government legislation, Industry bi-partite body – Guidelines/Codes of Practices or other related requirements for Safe work and access near live Electrical and Mechanical Apparatus.

Application of the Unit

Application of the Unit **2)**

This competency standards unit shall apply to Transmission, Distribution, Rail Traction, Telecommunications and Vegetation Management Control industry sectors.

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Licensing/Regulatory Information

License to practice **3)**

The skills and knowledge described in this unit may require a licence/registration to practice in the work place subject to regulations for undertaking of electrical work. Practice in workplace and during training is also subject to regulations directly related to Occupational Health and Safety, electricity/telecommunications/gas/water industry safety and compliance, industrial relations, environmental protection, anti discrimination and training. Commonwealth, State/Territory or Local Government legislation and regulations may exist that limits the age of operating certain equipment.

Pre-Requisites

Prerequisite Unit(s) **4)**

Competencies **4.1)**

Granting of competency in this unit shall be made only after competency in the following unit(s) has/have been confirmed.

Where pre-requisite pathways have been identified. All competencies in the Common Unit Group must be have been completed plus all the competencies in one (1) of the identified Pathway Unit Group(s):

There are no prerequisite competencies to this unit.

Literacy and numeracy skills **4.2)**

Participants are best equipped to achieve this unit if they have reading, writing and numeracy skills indicated by the following scales. Description of each scale is given in Volume 2, Part 3 “Literacy and Numeracy”.

Reading 3 Writing 3 Numeracy 3

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Employability Skills Information

Employability Skills **5)**

The required outcomes described in this unit of competency contain applicable facets of Employability Skills. The Employability Skills Summary of the qualification in which this unit of competency is packaged will assist in identifying Employability Skill requirements.

Elements and Performance Criteria Pre-Content

6) Elements describe the essential outcomes of a competency standard unit

Performance Criteria describe the required performance needed to demonstrate achievement of the element. Assessment of performance is to be consistent with the Evidence Guide.

Elements and Performance Criteria

ELEMENT	PERFORMANCE CRITERIA
1 Prepare to work safely near live electrical apparatus as electrical worker	1.1 Instructions related to the work to be performed safely near live electrical apparatus as electrical worker are received and confirmed.
	1.2 Relevant requirements and established procedures to be followed and, relevant personnel to be communicated with for the work to be performed are identified.
	1.3 OHS policies and procedures to be followed for the work to be performed are received and confirmed.
	1.4 Suggestions to assist in meeting the safety requirements for working near live electrical apparatus as an electrical worker are made to others involved in the work.
	1.5 Hazards are identified, OHS risks assessed and control measures are prioritised, implemented and monitored including emergency exits kept clear according to established procedures.

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ELEMENT	PERFORMANCE CRITERIA	
	1.6	Scope of responsibility and process of relevant work permit(s) issue is identified, received and confirmed according to requirements and established procedures.
	1.7	Relevant responsibility associated with First Aid, Safety Observers and/or other related work safety procedures at the worksite are identified in accordance with requirements and established procedures to ensure safety measures are followed in the instance of an incident.
	1.8	Processes for identifying and reporting client issues to appropriate personnel in accordance with industry/acceptable /community standards are identified.
	1.9	Site and the work schedule to be prepared are confirmed according to given instructions for a quality outcome and to minimise risk and damage to property, commerce, stock and individuals in accordance and established procedures.
	1.10	Electricity infrastructure assets, related voltages and requirements for working safely near live electrical apparatus as electrical worker are identified.
	1.11	Safe approach distances including any zones thereof that may apply, as defined in industry guidelines, requirements and/or established procedures for the intended work are confirmed.
2 Carry out the work safely near live electrical apparatus as electrical worker.	2.1	OHS principles and practices to reduce the incidents of accidents are identified in accordance with given instructions, requirements and/or established procedures.
	2.2	Working safely and complying with all safety requirements for working near live electrical apparatus as an electrical worker are followed in accordance with given instructions and established routines/procedures.
	2.3	Processes for monitoring and reporting/referring hazards and OHS risks to the immediate

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ELEMENT	PERFORMANCE CRITERIA	
		authorised personnel for directions according to established procedures are followed.
	2.4	Non-routine events are referred to the immediate authorised personnel for directions according to established procedures.
	2.5	Unexpected events associated with working safely near live electrical apparatus as an electrical worker are responded to using acquired known solutions and skills related to routine procedures to ensure work instructions and established procedures are met.
3 Complete the work safely near live electrical apparatus as electrical worker.	3.1	Work schedule and anomalies for completion and checking of the work are reported to authorised personnel in accordance with established procedures.
	3.2	Processes for reporting to authorised personnel accidents and/or incidents are confirmed in accordance with established procedures.
	3.3	Requirements for returning work permit(s) and/or access authorisation permits are confirmed.
	3.4	Appropriate personnel are notified of work completion according to established procedures.
	3.5	Works completion records, report forms/data sheets are completed accurately in accordance with given instructions and established procedures.

Required Skills and Knowledge

REQUIRED SKILLS AND KNOWLEDGE

8) Essential Knowledge and Associated Skills (EKAS): This describes the essential skills and knowledge and their level, required for this unit.

Evidence shall show that knowledge has been acquired of working safely near live electrical apparatus as electrical worker.

All knowledge and skills detailed in this unit should be contextualised to current

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REQUIRED SKILLS AND KNOWLEDGE

industry practices and technologies.

KS01-TEL16A ESI safe work practices near live electrical apparatus

Evidence shall show an understanding of ESI safe work practices near live electrical apparatus to an extent indicated by the following aspects:

T1 Electrical safety and principles encompassing:

- Hazards encountered in an electrical environment and safety procedures for dealing with them - types of hazards (hazards include electrical shock, fire from an electrical source, chemical hazards and fall hazards.), factors indicating general unsafe work practices and conditions, safety practices in the use of common tools and plant.
- Rescue techniques and first aid treatment of an electric shock victim - methods to rescue an electrical shock victim in contact with live equipment or conductors, accepted first aid treatment for burns, bleeding and shock, procedures for conducting EAR and CPR.
- Procedures for dealing with fires and hazardous chemicals associated with electrical equipment - selection and use of different types of equipment used to fight fires associated with electrical equipment, procedures for dealing with a fire associated with electrical equipment, procedures for dealing with PCBs.
- Basic circuit components and state the function of each - sources of electrical supply, control switches, types and functions of resistive consuming devices, basic circuit components symbols used in electrical diagrams.
- Connection of basic electrical circuits and measurement of circuit parameters - connection of components that make up a single-source single-load circuit, relationship between voltage and current in such circuits, consequences of a short-circuit and an open-circuit.
- Determining the voltage, current and resistance - calculation methods, measurement methods.
- Cable and conductor terminations to Australian/New Zealand standards - types of terminations, cable conductor preparation, prepare conductor for termination, termination method (conductor terminations include soldered and pressure types).

T2 Transmission, distribution and rail systems encompassing:

- Relationship between the transmission, distribution and rail/tram system within an overall power system - different organisations responsible for generation, transmission, distribution and rail/tram and, how they correlate and their functions
- Characteristics of a transmission, a distribution and a rail system - principal components, typical voltage levels and methods of transmission and distribution including grid type transmission systems, radial, parallel and ring main feeders
- Relationship between an overhead and underground supply systems within an overall power system - advantages/disadvantages, applications and the basic steps for planning and installing an overhead and underground distribution system
- Single line drawings and layouts - drawings and layouts of transmission and distribution systems including, radial, parallel and ring main feeders and the HV

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REQUIRED SKILLS AND KNOWLEDGE

equipment associated with substations

T3 Fundamentals for working safely near live electrical apparatus encompassing:

- Standards, guidelines/codes of practice, State/Territory/local government legislation, supply authority regulations and or enterprise requirements including relevant certification and licensing, applicable to working safely up to the defined "safe working zone" near energised electrical apparatus (inc. electrical powerlines) for non-electrical worker
- Definitions of terminologies - 'safe working zone' 'risk assessment', 'safe approach distances zones', 'safe working distances'.' work permits', access authorisation permits', 'Technical standards' 'isolation procedures' and compliance requirements'
- OHS policies and procedures for working safely - emergency response and First Aid procedures such as CPR, roles and responsibilities of employers, employees and other parties under OHS legislation, personal protective equipment, identifying hazards, assessing and controlling OHS risks, first aid procedures, duties of a safety observer, working at heights/confined spaces, permit to work systems and isolation procedures, safe application of different types of tools and equipment
- Operation of mobile plant and machinery (e.g. EWP) near live electrical apparatus
- Electricity supply infrastructure assets and voltages
- Techniques and precautions in undertaking different work functions and working safely up to the defined "safe working zone" near energised electrical apparatus (inc. electrical powerlines) for non-electrical worker - work functions that may be performed include, vegetation control, scaffolding, rigging, painting, and/or any other activity that requires working safely near live electrical apparatus by a non-electrical worker.

Evidence Guide

EVIDENCE GUIDE

9) This provides essential advice for assessment of the competency standard unit and must be read in conjunction with the Performance Criteria and the range statement of the competency standard unit and the Training Package Assessment Guidelines.

The Evidence Guide forms an integral part of this Competency Standard Unit and shall be used in conjunction with all component parts of this unit and, performed in accordance with the Assessment Guidelines of this Training Package.

Overview of Assessment **9.1)**

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Longitudinal competency development approaches to assessment, such as Profiling, require data to be reliably gathered in a form that can be consistently interpreted over time. This approach is best utilised in Apprenticeship programs and reduces assessment intervention. It is the Industry's preferred model for apprenticeships. However, where summative (or final) assessment is used it is to include the application of the competency in the normal work environment or, at a minimum, the application of the competency in a realistically simulated work environment. It is recognised that, in some circumstances, assessment in part or full can occur outside the workplace. However, it must be in accord with Industry and, Regulatory policy in this regard.

Methods chosen for a particular assessment will be influenced by various factors. These include the extent of the assessment, the most effective locations for the assessment activities to take place, access to physical resources, additional safety measures that may be required and the critical nature of the competencies being assessed.

The critical safety nature of working with electricity, electrical equipment, gas or any other hazardous substance/material carries risk in deeming a person competent. Hence, sources of evidence need to be 'rich' in nature so as to minimise error in judgment.

Activities associated with normal every day work have a bearing on the decision as to how much and how detailed the data gathered will contribute to its 'richness'. Some skills are more critical to safety and operational requirements while the same skills may be more or less frequently practiced. These points are raised for the assessors to consider when choosing an assessment method and developing assessment instruments. Sample assessment instruments are included for Assessors in the Assessment Guidelines of this Training Package.

Critical aspects of evidence required to demonstrate competency in this unit

9.2)

Before the critical aspects of evidence are considered all prerequisites shall be met.

Evidence for competence in this unit shall be considered holistically. Each element and associated Performance Criteria shall be demonstrated on at least two occasions in accordance with

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the “Assessment Guidelines – UET1211”. Evidence shall also comprise:

- A representative body of Performance Criteria demonstrated within the timeframes typically expected of the discipline, work function and industrial environment. In particular this shall incorporate evidence that shows a candidate is able to:
  - Implement Occupational Health and Safety workplace procedures and practices including the use of risk control measures as specified in the Performance Criteria and range; and
  - Apply sustainable energy principles and practices as specified in the Performance Criteria and range; and
  - Demonstrate an understanding of the essential knowledge and associated skills as described in this unit to such an extent that the learner’s performance outcome is reported in accordance with the preferred approach; namely a percentile graded result, where required by the regulated environment; and
  - Demonstrate an appropriate level of employability skills; and
- Conduct work observing the relevant Anti Discrimination legislation, regulations, policies and workplace procedures; and
  - Demonstrated performance across a representative range of contexts from the prescribed items below:

Range of tools/equipment/materials/procedures/workplaces/other variables		
Group No	**The minimum number of items on which skill is to be demonstrated**	**Item List**
A	All of the following:	Confirmation of the "safe working zone" for Safe work and access near live Electrical Apparatus Identification of the relevant technical standards. Acts, regulations and codes/guidelines Identification of

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		established (Enterprise) procedures
B	All of the following:	Confirmation of the principles of electricity, the three phase power system, electric shock and resuscitation, power system Recognition of aerial voltage systems Identification of Low Voltage Aerial Circuits Identification of High Voltage
C	All of the following:	Procedures in the event of an incident Events constituting an incident Procedures for responding to incidents Hazard and risk assessment procedure Conduct Work-site Hazard Assessment Confirmation of essential components of Hazard Assessment Checks Applying Hazard Identification in Electrical Work Confirmation of the Basic Safety Principles for Work on Electrical works Hazard Identification and Risk Assessment Hazard Control Risk Assessment and Management (JSAs)

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		Control The Hierarchy of Controls including Evaluation, Worksite Hazard and Risk Assessment Checklist, Pre-job Hazard Assessment Check (HAC) Items, Planned Inspection and Pre-Work Hazard Risk Assessment Form
D	All of the following:	Use of work permits and/or authorisation permits Sustainable energy principles and practices Possible affects of weather conditions on working near electrical apparatus as a electrical worker
E	At least one occasion	Dealing with an unplanned event by drawing on essential knowledge and associated skills to provide appropriate solutions incorporated in the holistic assessment with the above listed items.

Context of and specific resources for assessment

9.3)

This unit should be assessed as it relates to normal work practice using procedures, information and resources typical of a workplace. This should include:

- OHS policy and work procedures and instructions.
- Suitable work environment, facilities, equipment and materials

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to safely undertake actual work near live electrical apparatus

In addition to the resources listed above, in context of and specific resources for assessment, evidence should show demonstrated competency working below ground, in limited spaces, with different structural/construction types and method and in a variety of environments.

Method of assessment **9.4)**

This Competency Standard Unit shall be assessed by methods given in Volume 1, Part 3 “Assessment Guidelines”.

Note:

Competent performance with inherent safe working practices is expected in the Industry to which this Competency Standard Unit applies. This requires that the specified essential knowledge and associated skills are assessed in a structured environment which is primarily intended for learning/assessment and incorporates all necessary equipment and facilities for learners to develop and demonstrate the essential knowledge and associated skills described in this unit.

Concurrent assessment and relationship with other units **9.5)**

For optimisation of training and assessment effort, competence in this unit is not recommended to be assessed concurrently with any other unit.

Range Statement

RANGE STATEMENT

10) This relates to the competency standard unit as a whole providing the range of contexts and conditions to which the Performance Criteria apply. It allows for different work environments and situations that will affect performance.

This Competency Standard Unit shall be demonstrated in relation to safe working so defined by relevant State or Territory regulatory agencies/bodies, local government legislation, Industry bi-partite body – Guidelines/Codes of Practices or other related

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RANGE STATEMENT

requirements for Safe work and access near live Electrical Apparatus.

Work functions that may be performed, such as vegetation control, operation of cranes, elevating work platforms, excavators, concrete pumps etc, scaffolding, rigging, painting, and/or any other activity that requires working safely and complying with requirements and/or established procedures near live electrical apparatus by a electrical worker/

Working safely up to the defined “safe working zone” near energised electrical apparatus (inc. electrical powerlines) for electrical worker including an understanding of risk assessment control measures that encompass job safety assessment but excluding any work that is or may be performed by other competent operatives within the defined “safe working zone”.

Safe use of plant, equipment and tools within electrical environments including but not limited by the electricity supply infrastructure assets, infrastructure constructions and excavations including an understanding of safe approach distances zones/Safe Working Clearance, work permit(s) and/or access authorisation permits, technical standards and Industry Guidelines, rural applications, road construction, pavements and effect of inclement weather

The following constants and variables included in the element/Performance Criteria in this unit are fully described in the Definitions Section 1 of this volume and form an integral part of the Range Statement of this unit:

- Appropriate and relevant persons
- Appropriate authorities
- Assessing risk
- Authorisation
- Drawings and specifications
- Emergency
- Established procedures
- Hazards
- Identifying hazards
- Legislation
- Notification
- OHS practices
- OHS issues
- Permits and/or permits to work
- Work clearance systems

Unit Sector(s)

Not applicable.

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Competency Field

Competency Field **11)**

Entry Level – Cross Discipline Units.

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UETTDRIS41A Install network infrastructure electrical equipment

Modification History

Not applicable.

Unit Descriptor

Unit Descriptor **1) Scope:**

1.1) Descriptor

This Competency Standard Unit covers the installation of electrical equipment, such as fuse switches, drop out switches, sectionalisers, links, surge arrestors, gas filled and or oil filled switches, which are relevant to the transmission, distribution and rail networks. It includes the termination/connection of the equipment in accordance to enterprise requirements; the relevant pre-commissioning tests involving the equipment/system and the interpretation of these tests against agreed specifications.

Application of the Unit

Application of the Unit **2)**

This Competency Standard Unit is intended to augment formally acquired competencies. It is suitable for employment-based programs under an approved contract of training.

Licensing/Regulatory Information

License to practice **3)**

The skills and knowledge described in this unit may require a licence/registration to practice in the work place subject to regulations for undertaking of electrical work. Practice in workplace and during training is also subject to

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License to practice **3)**

regulations directly related to Occupational Health and Safety, electricity/telecommunications/gas/water industry safety and compliance, industrial relations, environmental protection, anti discrimination and training. Commonwealth, State/Territory or Local Government legislation and regulations may exist that limits the age of operating certain equipment.

Pre-Requisites

Prerequisite Unit(s) **4)**

Competencies **4.1)**

Granting of competency in this unit shall be made only after competency in the following unit(s) has/have been confirmed.

Where pre-requisite pathways have been identified. All competencies in the Common Unit Group must be have been completed plus all the competencies in one (1) of the identified Pathway Unit Group(s):

Transmission Overhead

Distribution Overhead

Rail Traction

Distribution Cable Jointing

Common Unit Group

UEENEEE101A	Apply Occupational Health and Safety regulations, codes and practices in the workplace
UEENEEE102A	Fabricate, assemble and dismantle utilities industry components
UEENEEE104A	Solve problems in d.c. Circuits
UEENEEE105A	Fix and secure electrotechnology equipment
UEENEEE107A	Use drawings, diagrams, schedules, standards, codes and specifications

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Prerequisite Unit(s) **4)**

UEENEEG101A	Solve problems in electromagnetic devices and related circuits
UEENEEG102A	Solve problems in low voltage a.c. Circuits
UETTDREL11A	Apply sustainable energy and environmental procedures
UETTDREL12A	Operate plant and equipment near live electrical conductors and apparatus
UETTDREL16A	Working safely near live electrical apparatus

Transmission Overhead Pathway Group

Unit Code	Unit Title
UETTDRIS54A	Install and maintain poles, structures, overhead conductors and cables
UETTDRTP26A	Install transmission structures and associated hardware
UETTDRTP27A	Maintain transmission structures and associated hardware
UETTDRTP29A	Install and maintain transmission overhead conductors and cables

Distribution Overhead Pathway Group

Unit Code	Unit Title
UETTDRDP12A	Maintain overhead energised low voltage conductors and cables
UETTDRIS52A	Install and maintain poles, structures and associated hardware
UETTDRIS54A	Install and maintain poles, structures, overhead conductors and cables
UETTDRIS56A	Install and maintain low voltage

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Prerequisite Unit(s) **4)**

overhead services

Rail Traction Pathway Group

Unit Code	Unit Title
UETTDRIS52A	Install and maintain poles, structures and associated hardware
UETTDRIS54A	Install and maintain poles, structures, overhead conductors and cables
UETTDRRT21A	Install traction overhead wiring systems
UETTDRRT22A	Maintain traction overhead wiring systems
UETTDRRT23A	Install rail traction bonds
UETTDRRT27A	Install overhead traction components and equipment
UETTDRRT28A	Maintain overhead traction components and equipment

Distribution Cable Jointing Pathway Group

Unit Code	Unit Title
UETTDRCJ21A	Lay ESI electrical cables
UETTDRCJ26A	Install and maintain de-energised low voltage underground polymeric cables.
UETTDRCJ27A	Install and maintain de-energised high voltage underground polymeric cables.
UETTDRIS55A	Install and maintain low voltage underground services

Literacy and numeracy skills **4.2)**

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Participants are best equipped to achieve this unit if they have reading, writing and numeracy skills indicated by the following scales. Description of each scale is given in Volume 2, Part 3 "Literacy and Numeracy"

Reading 3 Writing 3 Numeracy 3

Employability Skills Information

Employability Skills **5)**

The required outcomes described in this unit of competency contain applicable facets of Employability Skills. The Employability Skills Summary of the qualification in which this unit of competency is packaged will assist in identifying Employability Skill requirements.

Elements and Performance Criteria Pre-Content

6) Elements describe the essential outcomes of a competency standard unit

Performance Criteria describe the required performance needed to demonstrate achievement of the element. Assessment of performance is to be consistent with the Evidence Guide.

Elements and Performance Criteria

ELEMENT	PERFORMANCE CRITERIA
1 Prepare for the installation of electrical equipment (network infrastructure)	1.1 Works schedule(s), including drawings, plans, requirements, established procedures, and material lists, are received, analysed and confirmed, if necessary, by site inspection.
	1.2 Relevant requirements and established procedures for the work are communicated to all personnel and identified for all work sites.
	1.3 OHS policies and procedures related to requirements and established procedures for the

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ELEMENT	PERFORMANCE CRITERIA	
		installation of electrical equipment (network infrastructure) are obtained and confirmed for the purposes of the work to be performed and communicated.
	1.4	Work is prioritised and sequenced following consultation with others for completion within acceptable timeframes and in accordance with established procedures.
	1.5	Hazards are identified, OHS risks assessed and control measures are prioritised, implemented and monitored including emergency exits kept clear according to established procedures.
	1.6	Relevant work permits are obtained to access and perform work according to requirements and/or established procedures.
	1.7	Resources including personnel, equipment, tools and personal protective equipment required for the job are obtained and confirmed in working order.
	1.8	Relevant personnel at worksite are confirmed current in First Aid, Pole Top Rescue and other related work procedures according to requirements.
	1.9	Liaison and communication issues with other/authorised personnel, authorities, clients and land owners are resolved to carry out work where necessary.
	1.10	Site is prepared according to the work schedule and to minimise risk and damage to property, commerce, and individuals in accordance with established procedures.
	1.11	Personnel participating in the work, including plant operators and contractors, are fully briefed and respective responsibilities confirmed where applicable in accordance with established procedures.
	1.12	Road signs, barriers and warning devices are positioned in accordance with requirements.

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ELEMENT	PERFORMANCE CRITERIA
2 Carry out installation of electrical equipment (network infrastructure)	2.1 OHS and sustainable energy principles and practices to reduce the incidents of accidents and minimise waste are monitored and followed in accordance with requirements and/or established procedures.
	2.2 Lifting, climbing, working in confined spaces and aloft, and use of power tools/equipment, techniques and practices are safely followed and, currency according to requirements confirmed.
	2.3 Essential knowledge and associated skills are applied in the safe installation of electrical equipment (network infrastructure) to ensure completion in an agreed timeframe and, to quality standards with a minimum of waste according to requirements.
	2.4 Electrical equipment and associated hardware is positioned, secured and terminated/connected in accordance with requirements and established procedures.
	2.5 Hazard warnings and safety signs are recognised and hazards and assessed OHS risks are reported to the immediate authorised persons for directions according to established procedures.
	2.6 Unplanned events in the installation of electrical equipment (network infrastructure) are undertaken within the scope of established procedures.
	2.7 Known solutions to a variety of problems are applied using acquired essential knowledge and associated skills.
	2.8 Ongoing checks of quality of the work are undertaken in accordance with instructions and established procedures.
3 Complete the installation of electrical equipment (network infrastructure)	3.1 Work undertaken is checked/tested against works schedule for conformance with requirements and anomalies reported in accordance with established procedures.

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ELEMENT	PERFORMANCE CRITERIA
	3.2 Accidents and/or injuries are reported in accordance with requirements/established procedures, where applicable.
	3.3 Work site is rehabilitated, cleaned up and made safe in accordance with established procedures.
	3.4 Tools, equipment and any surplus resources and materials are, where appropriate, cleaned, checked and returned to storage in accordance with established procedures.
	3.5 Relevant work permit(s) are signed off and, electrical equipment (network infrastructure) are returned to service in accordance with requirements.
	3.6 Works completion records, reports, as installed /modified drawing and/or documentation and information are finalised and processed and appropriate personnel notified.

Required Skills and Knowledge

REQUIRED SKILLS AND KNOWLEDGE

8) Essential Knowledge and Associated Skills (EKAS): This describes the essential skills and knowledge and their level, required for this unit.

Evidence shall show that knowledge has been acquired of installing electrical equipment (network infrastructure).

All knowledge and skills detailed in this unit should be contextualised to current industry practices and technologies.

KS01-TIS41A Substations, power transformers and reactors

Evidence shall show an understanding of substations and power transformers to an extent indicated by the following aspects:

T1 Relationship between the substations within an overall power system

- Note: Examples include purpose, location in relation to load centres, layout of HV equipment within the substation and auxiliary equipment

T2 Characteristics of a power transformer

- Note: Examples include basic construction of distribution transformers,

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REQUIRED SKILLS AND KNOWLEDGE

operation under load/no load conditions, types and basic operation of tap changing switches including solid state types, efficiency and cooling

T3 Auxiliary equipment used on transformers encompassing:

- Function and basic operation

T4 Maintenance of a power transformer

- Note: Examples include basic connections, restrictions to parallel operation, problems and remedies associated with harmonics, testing and fault finding procedures

T5 Characteristics of a reactors encompassing:

- Description and purpose

KS02-TIS41A Switchgear installation

Evidence shall show an understanding of the installation of switchgear and associated equipment to an extent indicated by the following aspects:

T1 Types and function of various switchgear

- Note: Examples include isolators, air-break switches, gas-filled switches, vacuum type, links, fuses, oil disconnectors, fuse switches, circuit breakers, operating characteristics, advantages and disadvantages of different types switchgear, installation procedures, earthing, requirements and techniques

T2 Types of equipment

- Note: Examples include transformers, reactors, regulators, capacitors, relays, surge arrestors, fault indicators and mobile generators

T3 Installation procedures for switchgear and equipment encompassing:

- Standards, codes, legislation, supply authority regulations and or enterprise requirements
- Assembly and erecting procedures
- Earthing requirements and techniques
- Pole mounted locations

T4 Testing and commissioning encompassing:

- Electricity supply industry standards and procedures

Evidence Guide

EVIDENCE GUIDE

9) This provides essential advice for assessment of the unit of competency and must

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EVIDENCE GUIDE

be read in conjunction with the Performance Criteria and the range statement of the unit of competency and the Training Package Assessment Guidelines.

The Evidence Guide forms an integral part of this Competency Standard Unit and shall be used in conjunction with all component parts of this unit and, performed in accordance with the Assessment Guidelines of this Training Package.

Overview of Assessment **9.1)**

Longitudinal competency development approaches to assessment, such as Profiling, require data to be reliably gathered in a form that can be consistently interpreted over time. This approach is best utilised in Apprenticeship programs and reduces assessment intervention. It is the Industry's preferred model for apprenticeships. However, where summative (or final) assessment is used it is to include the application of the competency in the normal work environment or, at a minimum, the application of the competency in a realistically simulated work environment. It is recognised that, in some circumstances, assessment in part or full can occur outside the workplace. However, it must be in accord with Industry and, Regulatory policy in this regard.

Methods chosen for a particular assessment will be influenced by various factors. These include the extent of the assessment, the most effective locations for the assessment activities to take place, access to physical resources, additional safety measures that may be required and the critical nature of the competencies being assessed.

The critical safety nature of working with electricity, electrical equipment, gas or any other hazardous substance/material carries risk in deeming a person competent. Hence, sources of evidence need to be 'rich' in nature so as to minimise error in judgment.

Activities associated with normal every day work have a bearing on the decision as to how much and how detailed the data gathered will contribute to its 'richness'. Some skills are more critical to safety and operational requirements while the same skills may be more or less frequently practiced. These points are raised for the assessors to consider when choosing an assessment method and developing assessment instruments. Sample assessment instruments are included for Assessors in the Assessment Guidelines of this Training Package.

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Critical aspects of evidence required to demonstrate competency in this unit **9.2)**

Before the critical aspects of evidence are considered all prerequisites shall be met.

Evidence for competence in this unit shall be considered holistically. Each element and associated Performance Criteria shall be demonstrated on at least two occasions in accordance with the "Assessment Guidelines – UET12". Evidence shall also comprise:

- A representative body of Performance Criteria demonstrated within the timeframes typically expected of the discipline, work function and industrial environment. In particular this shall incorporate evidence that shows a candidate is able to:
  - Implement Occupational Health and Safety workplace procedures and practices including the use of risk control measures as specified in the Performance Criteria and range; and
  - Apply sustainable energy principles and practices as specified in the Performance Criteria and range; and
  - Demonstrate an understanding of the essential knowledge and associated skills as described in this unit to such an extent that the learner's performance outcome is reported in accordance with the preferred approach; namely a percentile graded result, where required by the regulated environment; and
  - Demonstrate an appropriate level of employability skills; and
- Conduct work observing the relevant Anti Discrimination legislation, regulations, policies and workplace procedures; and
  - Demonstrated performance across a representative range of contexts from the prescribed items below:

Range of tools/equipment/materials/procedures/workplaces/other variables		
Group No	**The minimum number of items on which skill is to be demonstrated**	**Item List**

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A	Any three of the following:	Fuse switches Dropout fuses Sectionalisers Disconnectors Links Fuses Surge arrestors
B	Any one of the following:	Reclosers Motorised switches Gas filled switches Ring main units Line fault indicators Oil filled switches Air break switches
C	Any one of the following:	Transformers Reactors Regulators Capacitors
D	Any three of the following:	Voltage detectors Phasing equipment Clip-on ammeters Insulation resistance testers Recording meters Earth resistance tester
E	At least one occasion:	Dealing with an unplanned event by drawing on essential knowledge and associated skills to provide appropriate solutions incorporated in the holistic assessment with the above listed items.

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Context of and specific resources for assessment **9.3)**

This unit should be assessed as it relates to normal work practice using procedures, information and resources typical of a workplace. This should include:

- OHS policy and work procedures and instructions.
- Suitable work environment, facilities, equipment and materials to undertake actual installation of electrical equipment in a network infrastructure.

In addition to the resources listed above, in Context of and specific resources for assessment, evidence should show demonstrated competency working below ground, in limited spaces, with different structural/construction types and method and in a variety of environments.

Method of assessment **9.4)**

This Competency Standard Unit shall be assessed by methods given in Volume 1, Part 3 “Assessment Guidelines”.

Note:

Competent performance with inherent safe working practices is expected in the Industry to which this Competency Standard Unit applies. This requires that the specified essential knowledge and associated skills are assessed in a structured environment which is primarily intended for learning/assessment and incorporates all necessary equipment and facilities for learners to develop and demonstrate the essential knowledge and associated skills described in this unit.

Concurrent assessment and relationship with other units **9.5)**

There are no concurrent assessment recommendations for this unit.

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Range Statement

RANGE STATEMENT

10) This relates to the unit of competency as a whole providing the range of contexts and conditions to which the Performance Criteria apply. It allows for different work environments and situations that will affect performance.

This Competency Standard Unit shall be demonstrated in relation to the installation, termination/connection of overhead electrical equipment relevant to the transmission, distribution and rail networks, and includes pre-commissioning.

Electrical equipment and associated hardware may include relevant transmission or distribution linework/network; switchgear (e.g. reclosers, sectionalisers, drop-out fuses, disconnectors, isolators, air break switches, gas filled switches, links, fuses, fuse switches and circuit breakers); transformers (e.g. padmount, pole-mounted and mobile); reactors; fault indicators; regulators; street lighting control points; capacitors; cables; underground/overhead cable terminations; relays (simple); mobile generators and surge arrestors; support brackets and the like.

It does not include the energisation of equipment in a highly complex, interdependent and interconnected electricity supply Network system, where the affects of unintended consequences on the system are high risk and appropriate personnel effect energisation.

Test and recording equipment includes voltage detectors, phasing equipment, tong ammeters, voltmeters, recording meters and insulation resistance testers used for the purposes as intended and according to requirements, and does not include use of such in energising installed equipment in a highly complex, interdependent and interconnected electricity supply Network system, where the affects of unintended consequences on the system are high risk.

The following constants and variables included in the element/Performance Criteria in this unit are fully described in the Definitions Section 1 of this volume and form an integral part of the Range Statement of this unit:

- Appropriate and relevant persons (see Personnel)
- Appropriate authorities
- Appropriate work platform
- Assessing risk
- Assessment
- Authorisation
- Confined space
- Diagnostic, testing and restoration
- Documenting detail work events, record keeping and or storage of information
- Drawings and specifications
- Emergency
- Environmental and sustainable energy procedures

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RANGE STATEMENT

- Environmental legislation
- Environmental management documentation
- Established procedures
- Fall prevention
- Hazards
- Identifying hazards
- Inspect
- Legislation
- MSDS
- Notification
- OHS practices
- OHS issues
- Permits and/or permits to work
- Personnel
- Quality assurance systems
- Requirements
- Testing procedures
- Work clearance systems

Unit Sector(s)

Not applicable.

Competency Field

Competency Field **11)**

Industry Specific Cross-Discipline Units

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UETTDRIS42A Maintain network infrastructure electrical equipment

Modification History

Not applicable.

Unit Descriptor

Unit Descriptor **1) Scope:**

1.1) Descriptor

This Competency Standard Unit covers the maintenance of electrical equipment and associated hardware, such as fuse switches, drop out switches, sectionalisers, links, surge arrestors, gas filled and or oil filled switches, relevant to the transmission, distribution and rail traction networks and includes the repair and/or replacement of "like for like" electrical equipment and associated hardware as well as the termination and/or connection of this equipment according to requirements and may include sampling of insulating oils. It also encompasses the identification of faults, the pre-commissioning tests involving the equipment/system and the interpretation of these tests against agreed specifications. It excludes the energisation of the equipment maintained in a highly complex, interdependent and interconnected electricity supply Network system, where the affects of unintended consequences on the system are high risk and appropriate personnel effect energisation.

Application of the Unit

Application of the Unit **2)**

This Competency Standard Unit is intended to augment formally acquired competencies. It is suitable for employment-based programs under an approved contract of training.

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Licensing/Regulatory Information

License to practice **3)**

The skills and knowledge described in this unit may require a licence/registration to practice in the work place subject to regulations for undertaking of electrical work. Practice in workplace and during training is also subject to regulations directly related to Occupational Health and Safety, electricity/telecommunications/gas/water industry safety and compliance, industrial relations, environmental protection, anti discrimination and training. Commonwealth, State/Territory or Local Government legislation and regulations may exist that limits the age of operating certain equipment.

Pre-Requisites

Prerequisite Unit(s) **4)**

Competencies **4.1)**

Granting of competency in this unit shall be made only after competency in the following unit(s) has/have been confirmed.

Where pre-requisite pathways have been identified. All competencies in the Common Unit Group must be have been completed plus all the competencies in one (1) of the identified Pathway Unit Group(s):

Transmission Overhead

Distribution Overhead

Rail Traction

Distribution Cable Jointing

Common Unit Group

Unit Code	Unit Title
UEENEEE101A	Apply Occupational Health and Safety regulations, codes and practices in the workplace
UEENEEE102A	Fabricate, assemble and dismantle utilities industry components

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Prerequisite Unit(s) **4)**

UEENEEE104A	Solve problems in d.c. Circuits
UEENEEE105A	Fix and secure electrotechnology equipment
UEENEEE107A	Use drawings, diagrams, schedules, standards, codes and specifications
UEENEEG101A	Solve problems in electromagnetic devices and related circuits
UEENEEG102A	Solve problems in low voltage a.c. Circuits
UETTDREL11A	Apply sustainable energy and environmental procedures
UETTDREL12A	Operate plant and equipment near live electrical conductors and apparatus
UETTDREL16A	Working safely near live electrical apparatus

Transmission Overhead Pathway Group

Unit Code	Unit Title
UETTDRIS41A	Install network infrastructure electrical equipment
UETTDRIS54A	Install and maintain poles, structures, overhead conductors and cables
UETTDRTP26A	Install transmission structures and associated hardware
UETTDRTP27A	Maintain transmission structures and associated hardware
UETTDRTP29A	Install and maintain transmission overhead conductors and cables

Distribution Overhead Pathway Group

Unit Code	Unit Title

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Prerequisite Unit(s) **4)**

UETTDRDP12A	Maintain overhead energised low voltage conductors and cables
UETTDRIS41A	Install network infrastructure electrical equipment
UETTDRIS52A	Install and maintain poles, structures and associated hardware
UETTDRIS54A	Install and maintain poles, structures, overhead conductors and cables
UETTDRIS56A	Install and maintain low voltage overhead services

Rail Traction Pathway Group

Unit Code	Unit Title
UETTDRIS41A	Install network infrastructure electrical equipment
UETTDRIS52A	Install and maintain poles, structures and associated hardware
UETTDRIS54A	Install and maintain poles, structures, overhead conductors and cables
UETTDRRT21A	Install traction overhead wiring systems
UETTDRRT22A	Maintain traction overhead wiring systems
UETTDRRT23A	Install rail traction bonds
UETTDRRT27A	Install overhead traction components and equipment
UETTDRRT28A	Maintain overhead traction components and equipment

Distribution Cable Jointing Pathway Group

Unit Code	Unit Title

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Prerequisite Unit(s) **4)**

UETTDRCJ21A	Lay ESI electrical cables
UETTDRCJ26A	Install and maintain de-energised low voltage underground polymeric cables.
UETTDRCJ27A	Install and maintain de-energised high voltage underground polymeric cables.
UETTDRIS41A	Install network infrastructure electrical equipment
UETTDRIS55A	Install and maintain low voltage underground services

Literacy and numeracy skills **4.2)**

Participants are best equipped to achieve this unit if they have reading, writing and numeracy skills indicated by the following scales. Description of each scale is given in Volume 2, Part 3 “Literacy and Numeracy”

Reading 3 Writing 3 Numeracy 3

Employability Skills Information

Employability Skills **5)**

The required outcomes described in this unit of competency contain applicable facets of Employability Skills. The Employability Skills Summary of the qualification in which this unit of competency is packaged will assist in identifying Employability Skill requirements.

Elements and Performance Criteria Pre-Content

6) Elements describe the essential outcomes of a

Performance Criteria describe the required performance needed to demonstrate achievement of the element.

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competency standard unit	Assessment of performance is to be consistent with the Evidence Guide.

Elements and Performance Criteria

ELEMENT	PERFORMANCE CRITERIA	
1 Prepare for the maintenance of electrical equipment (network infrastructure)	1.1	Works schedule(s), including drawings, plans, requirements, established procedures, and material lists, are received, analysed and confirmed, if necessary, by site inspection.
	1.2	Relevant requirements and established procedures for the work are communicated to all personnel and identified for all work sites.
	1.3	OHS policies and procedures related to requirements and established procedures the maintenance of electrical equipment (network infrastructure) are obtained and confirmed for the purposes of the work to be performed and communicated.
	1.4	Work is prioritised and sequenced following consultation with others for completion within acceptable timeframes and in accordance with established procedures.
	1.5	Hazards are identified, OHS risks assessed and control measures are prioritised, implemented and monitored including emergency exits kept clear according to established procedures.
	1.6	Relevant work permits are obtained to access and perform work according to requirements and/or established procedures.
	1.7	Resources including personnel, equipment, tools and personal protective equipment required for the job are obtained and confirmed in working order.
	1.8	Relevant personnel at worksite are confirmed current in First Aid, Pole Top Rescue and other related work procedures according to requirements.

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ELEMENT	PERFORMANCE CRITERIA	
	1.9	Liaison and communication issues with other/authorised personnel, authorities, clients and land owners are resolved to carry out work where necessary.
	1.10	Site is prepared according to the work schedule and to minimise risk and damage to property, commerce, and individuals in accordance with established procedures.
	1.11	Personnel participating in the work, including plant operators and contractors, are fully briefed and respective responsibilities confirmed where applicable in accordance with established procedures.
	1.12	Road signs, barriers and warning devices are positioned in accordance with requirements.
2 Carry out maintenance of electrical equipment (network infrastructure)	2.1	OHS and sustainable energy principles and practices to reduce the incidents of accidents and minimise waste are monitored and followed in accordance with requirements and/or established procedures.
	2.2	Lifting, climbing, working in confined spaces and aloft, and use of power tools/equipment, techniques and practices are safely followed and, currency according to requirements confirmed.
	2.3	Essential knowledge and associated kills are applied in the safe maintenance of electrical equipment (network infrastructure) to ensure completion in an agreed timeframe and, to quality standards with a minimum of waste according to requirements.
	2.4	Maintenance, including repair and/or replacement of electrical equipment (network infrastructure) is carried out, in accordance with the work schedule and requirements/established procedures.
	2.5	Hazard warnings and safety signs are recognised and hazards and assessed OHS risks are reported to the immediate authorised persons for

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ELEMENT	PERFORMANCE CRITERIA	
		directions according to established procedures.
	2.6	Unplanned events in the maintenance of electrical equipment (network infrastructure) are undertaken within the scope of established procedures.
	2.7	Known solutions to a variety of problems are applied using acquired essential knowledge and associated skills.
	2.8	Ongoing checks of quality of the work are undertaken in accordance with instructions and established procedures.
3 Complete the maintenance of electrical equipment (network infrastructure)	3.1	Work undertaken is checked/tested against works schedule for conformance with requirements and anomalies reported in accordance with established procedures.
	3.2	Accidents and/or injuries are reported in accordance with requirements/established procedures, where applicable.
	3.3	Work site is rehabilitated, cleaned up and made safe in accordance with established procedures.
	3.4	Tools, equipment and any surplus resources and materials are, where appropriate, cleaned, checked and returned to storage in accordance with established procedures.
	3.5	Relevant work permit(s) are signed off and, electrical equipment (network infrastructure) is returned to service in accordance with requirements.
	3.6	Works completion records, reports, as installed/modified drawing and/or documentation and information are finalised and processed and appropriate personnel notified.

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Required Skills and Knowledge

REQUIRED SKILLS AND KNOWLEDGE

8) Essential Knowledge and Associated Skills (EKAS): This describes the essential skills and knowledge and their level, required for this unit.

Evidence shall show that knowledge has been acquired of maintaining electrical equipment (network infrastructure).

All knowledge and skills detailed in this unit should be contextualised to current industry practices and technologies.

KS01-TIS42A Switchgear installation maintenance

Evidence shall show an understanding of the installation of switchgear and associated equipment to an extent indicated by the following aspects:

T1 Types and function of various switchgear

- Note: Examples include isolators, air-break switches, gas-filled switches, vacuum type, links, fuses, oil disconnectors, fuse switches, circuit breakers, operating characteristics, advantages and disadvantages of different types switchgear, installation procedures, earthing, requirements and techniques

T2 Types of equipment

- Note: Examples include transformers, reactors, regulators, capacitors, relays, surge arrestors, fault indicators and mobile generators

T3 Maintenance procedures for switchgear and equipment encompassing:

- Diagnosing and rectifying faults according to electricity supply industry standards and procedures

T4 Testing and commissioning encompassing:

- Electricity supply industry standards and procedures

Evidence Guide

EVIDENCE GUIDE

9) This provides essential advice for assessment of the unit of competency and must be read in conjunction with the Performance Criteria and the range statement of the unit of competency and the Training Package Assessment Guidelines.

The Evidence Guide forms an integral part of this Competency Standard Unit and shall be used in conjunction with all component parts of this unit and, performed in accordance with the Assessment Guidelines of this Training Package.

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Overview of Assessment **9.1)**

Longitudinal competency development approaches to assessment, such as Profiling, require data to be reliably gathered in a form that can be consistently interpreted over time. This approach is best utilised in Apprenticeship programs and reduces assessment intervention. It is the Industry's preferred model for apprenticeships. However, where summative (or final) assessment is used it is to include the application of the competency in the normal work environment or, at a minimum, the application of the competency in a realistically simulated work environment. It is recognised that, in some circumstances, assessment in part or full can occur outside the workplace. However, it must be in accord with Industry and, Regulatory policy in this regard.

Methods chosen for a particular assessment will be influenced by various factors. These include the extent of the assessment, the most effective locations for the assessment activities to take place, access to physical resources, additional safety measures that may be required and the critical nature of the competencies being assessed.

The critical safety nature of working with electricity, electrical equipment, gas or any other hazardous substance/material carries risk in deeming a person competent. Hence, sources of evidence need to be 'rich' in nature so as to minimise error in judgment.

Activities associated with normal every day work have a bearing on the decision as to how much and how detailed the data gathered will contribute to its 'richness'. Some skills are more critical to safety and operational requirements while the same skills may be more or less frequently practiced. These points are raised for the assessors to consider when choosing an assessment method and developing assessment instruments. Sample assessment instruments are included for Assessors in the Assessment Guidelines of this Training Package.

Critical aspects of evidence required to demonstrate competency in this unit **9.2)**

Before the critical aspects of evidence are considered all prerequisites shall be met.

Evidence for competence in this unit shall be considered

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holistically. Each element and associated Performance Criteria shall be demonstrated on at least two occasions in accordance with the "Assessment Guidelines – UET12". Evidence shall also comprise:

- A representative body of Performance Criteria demonstrated within the timeframes typically expected of the discipline, work function and industrial environment. In particular this shall incorporate evidence that shows a candidate is able to:
  - Implement Occupational Health and Safety workplace procedures and practices including the use of risk control measures as specified in the Performance Criteria and range; and
  - Apply sustainable energy principles and practices as specified in the Performance Criteria and range; and
  - Demonstrate an understanding of the essential knowledge and associated skills as described in this unit to such an extent that the learner's performance outcome is reported in accordance with the preferred approach; namely a percentile graded result, where required by the regulated environment; and
  - Demonstrate an appropriate level of employability skills; and
- Conduct work observing the relevant Anti Discrimination legislation, regulations, policies and workplace procedures; and
  - Demonstrated performance across a representative range of contexts from the prescribed items below:

Range of tools/equipment/materials/procedures/workplaces/other variables		
Group No	**The minimum number of items on which skill is to be demonstrated**	**Item List**
A	Any three of the following:	Fuse switches Dropout fuses Sectionalisers Disconnectors Links Fuses Surge arrestors

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B	Any one of the following:	Reclosers Gas filled switches Ring main units Oil filled switches Air break switches
C	Any one of the following:	Transformers Reactors Regulators Capacitors Relays Line fault indicators
D	Any three of the following:	Voltage detectors Phasing equipment Clip-on ammeters Insulation resistance testers Recording meters Earth resistance testers
E	At least one occasion:	Dealing with an unplanned event by drawing on essential knowledge and associated skills to provide appropriate solutions incorporated in the holistic assessment with the above listed items.

Context of and specific resources for assessment **9.3)**

This unit should be assessed as it relates to normal work practice using procedures, information and resources typical of a workplace. This should include:

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- OHS policy and work procedures and instructions.
- Suitable work environment, facilities, equipment and materials to undertake actual maintenance of electrical equipment in the network infrastructure.

In addition to the resources listed above, in Context of and specific resources for assessment, evidence should show demonstrated competency working below ground, in limited spaces, with different structural/construction types and method and in a variety of environments.

Method of assessment

9.4)

This Competency Standard Unit shall be assessed by methods given in Volume 1, Part 3 “Assessment Guidelines”.

Note:

Competent performance with inherent safe working practices is expected in the Industry to which this Competency Standard Unit applies. This requires that the specified essential knowledge and associated skills are assessed in a structured environment which is primarily intended for learning/assessment and incorporates all necessary equipment and facilities for learners to develop and demonstrate the essential knowledge and associated skills described in this unit.

Concurrent assessment and relationship with other units

9.5)

There are no concurrent assessment recommendations for this unit.

Range Statement

RANGE STATEMENT

10) This relates to the unit of competency as a whole providing the range of contexts and conditions to which the Performance Criteria apply. It allows for different work environments and situations that will affect performance.

This Competency Standard Unit shall be demonstrated in relation to the maintenance of overhead electrical equipment relevant to the transmission, distribution and rail

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RANGE STATEMENT

networks.

Maintenance may include the removal, repair and replacement of electrical equipment encompassing “like for like” and associated hardware as well as the termination and/or connection of this equipment according to requirements and may include sampling of insulating oils. It also encompasses the identification of faults; the pre-commissioning tests involving the equipment/system and the interpretation of these tests against agreed specifications. It excludes the energisation of the equipment maintained in a highly complex, interdependent and interconnected electricity supply Network system, where the affects of unintended consequences on the system are high risk and appropriate personnel effect energisation.

Electrical equipment and associated hardware may include relevant transmission or distribution linework/network; switchgear (e.g. reclosers, sectionalisers, drop-out fuses, disconnectors, isolators, air break switches, gas filled switches, links, fuses, fuse switches and circuit breakers); transformers (e.g. padmount, pole-mounted and mobile); reactors; fault indicators; regulators; street lighting control points; capacitors; cables; underground/overhead cable terminations; underground cable joints; relays (simple); mobile generators and surge arrestors; support brackets and the like.

Test and recording equipment includes voltage detectors, phasing equipment, tong ammeters, voltmeters, recording meters, insulation resistance testers and may include the, sampling of transformers, switchgear and cable insulating oil and tests for dielectric strength and moisture used for the purposes as intended and according to requirements, and does not include use of such in energising equipment and circuits in a highly complex, interdependent and interconnected electricity supply Network system, where the affects of unintended consequences on the system are high risk.

Equipment may include Pump, filter press, hoses, pipes, soil kits, sample bottles, storage vessels etc.

The following constants and variables included in the element/Performance Criteria in this unit are fully described in the Definitions Section 1 of this volume and form an integral part of the Range Statement of this unit:

- Appropriate and relevant persons (see Personnel)
- Appropriate authorities
- Appropriate work platform
- Assessing risk
- Assessment
- Authorisation
- Confined space
- Diagnostic, testing and restoration
- Documenting detail work events, record keeping and or storage of information
- Drawings and specifications
- Emergency

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RANGE STATEMENT

- Environmental and sustainable energy procedures
- Environmental legislation
- Environmental management documentation
- Established procedures
- Fall prevention
- Hazards
- Identifying hazards
- Inspect
- Legislation
- MSDS
- Notification
- OHS practices
- OHS issues
- Permits and/or permits to work
- Personnel
- Quality assurance systems
- Requirements
- Testing procedures
- Work clearance systems

Unit Sector(s)

Not applicable.

Competency Field

Competency Field **11)**

Industry Specific Cross-Discipline Units

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UETTDRIS44A Perform HV field switching operation to a given schedule

Modification History

Not applicable.

Unit Descriptor

Unit Descriptor **1) Scope:**

1.1) Descriptor

This Competency Standard Unit covers the carrying out of high voltage switching operations involving the operation of circuit breaking and isolation devices from a given switching schedule and according to enterprise procedures. It also encompasses the process of; communicating with the Switching Control Officer or Electrical Control Officer, isolating the electrical equipment and the line or work site, as well as proving that the area is de-energised and earthed, issuing/accepting electrical permits and the returning of the affected circuits to service.

Application of the Unit

Application of the Unit **2)**

This Competency Standard Unit is intended to augment formally acquired competencies. It is suitable for employment-based programs under an approved contract of training.

Licensing/Regulatory Information

License to practice **3)**

The skills and knowledge described in this unit may require a licence/registration to practice in the work place subject to regulations for undertaking of electrical work.

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License to practice **3)**

Practice in workplace and during training is also subject to regulations directly related to Occupational Health and Safety, electricity/telecommunications/gas/water industry safety and compliance, industrial relations, environmental protection, anti discrimination and training. Commonwealth, State/Territory or Local Government legislation and regulations may exist that limits the age of operating certain equipment.

Pre-Requisites

Prerequisite Unit(s) **4)**

Competencies **4.1)**

Granting of competency in this unit shall be made only after competency in the following unit(s) has/have been confirmed.

Where pre-requisite pathways have been identified. All competencies in the Common Unit Group must be have been completed plus all the competencies in one (1) of the identified Pathway Unit Group(s):

Transmission Overhead

Distribution Overhead

Rail Traction

Distribution Cable Jointing

Electrical

Common Unit Group

Unit Code	Unit Title
UEENEEE101A	Apply Occupational Health and Safety regulations, codes and practices in the workplace
UEENEEE102A	Fabricate, assemble and dismantle utilities industry components
UEENEEE104A	Solve problems in d.c. Circuits
UEENEEE105A	Fix and secure electrotechnology

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Prerequisite Unit(s) **4)**

	equipment
UEENEEE107A	Use drawings, diagrams, schedules, standards, codes and specifications
UEENEEG101A	Solve problems in electromagnetic devices and related circuits
UEENEEG102A	Solve problems in low voltage a.c. Circuits
UETTDREL16A	Working safely near live electrical apparatus

Transmission Overhead Pathway Group

Unit Code	Unit Title
UETTDREL11A	Apply sustainable energy and environmental procedures
UETTDREL12A	Operate plant and equipment near live electrical conductors and apparatus
UETTDRIS54A	Install and maintain poles, structures, overhead conductors and cables
UETTDRTP26A	Install transmission structures and associated hardware
UETTDRTP27A	Maintain transmission structures and associated hardware
UETTDRTP29A	Install and maintain transmission overhead conductors and cables

Distribution Overhead Pathway Group

Unit Code	Unit Title
UETTDREL11A	Apply sustainable energy and environmental procedures
UETTDRDP12A	Maintain overhead energised low voltage conductors and cables
UETTDREL12A	Operate plant and equipment near live electrical conductors and apparatus

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Prerequisite Unit(s) **4)**

UETTDRIS41A	Install network infrastructure electrical equipment
UETTDRIS42A	Maintain network infrastructure electrical equipment
UETTDRIS52A	Install and maintain poles, structures and associated hardware
UETTDRIS54A	Install and maintain poles, structures, overhead conductors and cables
UETTDRIS56A	Install and maintain low voltage overhead services

Rail Traction Pathway Group

Unit Code	Unit Title
UETTDREL11A	Apply sustainable energy and environmental procedures
UETTDREL12A	Operate plant and equipment near live electrical conductors and apparatus
UETTDRIS52A	Install and maintain poles, structures and associated hardware
UETTDRIS54A	Install and maintain poles, structures, overhead conductors and cables
UETTDRRT21A	Install traction overhead wiring systems
UETTDRRT22A	Maintain traction overhead wiring systems
UETTDRRT23A	Install rail traction bonds
UETTDRRT27A	Install overhead traction components and equipment
UETTDRRT28A	Maintain overhead traction components and equipment

Distribution Cable Jointing Pathway Group

Unit Code	Unit Title

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Prerequisite Unit(s) **4)**

UETTDRCJ21A	Lay ESI electrical cables
UETTDRCJ26A	Install and maintain de-energised low voltage underground polymeric cables.
UETTDRCJ27A	Install and maintain de-energised high voltage underground polymeric cables.
UETTDREL11A	Apply sustainable energy and environmental procedures
UETTDREL12A	Operate plant and equipment near live electrical conductors and apparatus
UETTDRIS41A	Install network infrastructure electrical equipment
UETTDRIS42A	Maintain network infrastructure electrical equipment
UETTDRIS55A	Install and maintain low voltage underground services

Electrical Pathway Group

Unit Code	Unit Title
UEENEEE137A	Document and apply measures to control OHS risks associated with electrotechnology work
UEENEEG006A	Solve problems in single and three phase low voltage machines
UEENEEG033A	Solve problems in single and three phase electrical apparatus and circuits
UEENEEG063A	Arrange circuits, control and protection for general electrical installations
UEENEEG106A	Terminate cables, cords and accessories for low voltage circuits
UEENEEG108A	Trouble-shoot and repair faults in low voltage electrical apparatus and circuits
UEENEEG109A	Develop and connect electrical control circuits

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Prerequisite Unit(s) **4)**

UEENEEK142A	Apply environmentally and sustainable energy procedures in the energy sector
UETTDRIS67A	Solve problems in energy supply network equipment

Literacy and numeracy skills **4.2)**

Participants are best equipped to achieve this unit if they have reading, writing and numeracy skills indicated by the following scales. Description of each scale is given in Volume 2, Part 3 “Literacy and Numeracy”

Reading 3 Writing 3 Numeracy 3

Employability Skills Information

Employability Skills **5)**

The required outcomes described in this unit of competency contain applicable facets of Employability Skills. The Employability Skills Summary of the qualification in which this unit of competency is packaged will assist in identifying Employability Skill requirements.

Elements and Performance Criteria Pre-Content

6) Elements describe the essential outcomes of a competency standard unit

Performance Criteria describe the required performance needed to demonstrate achievement of the element. Assessment of performance is to be consistent with the Evidence Guide.

Elements and Performance Criteria

ELEMENT **PERFORMANCE CRITERIA**

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ELEMENT	PERFORMANCE CRITERIA	
1 Prepare to undertake HV switching procedures to a given schedule	1.1	Switching and work schedule(s), including drawings, plans, requirements, established procedures, and material lists, are received, analysed and confirmed, if necessary, by site inspection.
	1.2	Relevant requirements and established procedures for the work are communicated to all personnel and identified for all work sites.
	1.3	OHS policies and procedures related to requirements and established procedures for HV switching are obtained and confirmed for the purposes of the work to be performed and communicated.
	1.4	Work is prioritised and sequenced following consultation with others for completion within acceptable timeframes and in accordance with established procedures.
	1.5	Hazards are identified, OHS risks assessed and control measures are prioritised, implemented and monitored including emergency exits kept clear according to established procedures.
	1.6	Relevant authority is obtained to perform work according to requirements and/or established procedures.
	1.7	Resources including personnel, equipment, tools and personal protective equipment required for the job are obtained and confirmed in working order.
	1.8	Relevant personnel at worksite are confirmed current in First Aid and other related work procedures according to requirements.
	1.9	Liaison and communication issues with other/authorised personnel, authorities, clients and land owners are resolved to carry out work where necessary.
	1.10	Site is prepared according to the work schedule and to minimise risk and damage to property, commerce, and individuals in accordance with

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ELEMENT	PERFORMANCE CRITERIA	
		established procedures.
	1.11	Personnel participating in the work, including plant operators and contractors, are fully briefed and respective responsibilities confirmed where applicable in accordance with established procedures.
	1.12	Road signs, barriers and warning devices are positioned in accordance with requirements.
2 Carry out HV switching procedures to a given schedule	2.1	OHS and sustainable energy principles and practices to reduce the incidents of accidents and minimise waste are monitored and followed in accordance with requirements and/or established procedures.
	2.2	Lifting, climbing, working in confined spaces and aloft, and use of power tools/equipment, techniques and practices are safely followed and, currency according to requirements confirmed.
	2.3	Essential knowledge and associated skills are applied for the safe undertaking of HV switching procedures to a given schedule to ensure completion in an agreed timeframe and, to quality standards with a minimum of waste according to requirements.
	2.4	Communications with Switching Control Officer are established and maintained throughout the isolation operation according to established procedures.
	2.5	Electrical equipment and associated circuits line/network or work site to be switched including paralleling is isolated and proved de-energised using appropriate devices and earthed where required according to requirements and established procedures.
	2.6	Hazard warnings and safety signs are recognised and hazards and assessed OHS risks are reported to the immediate authorised persons for directions according to established procedures.
	2.7	Unplanned events occurring during HV switching

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ELEMENT	PERFORMANCE CRITERIA	
		procedures to a given schedule are responded to and undertaken within the scope of established procedures.
	2.8	Relevant permits are prepared and issued in accordance with established procedures.
	2.9	Known solutions to a variety of problems are applied using acquired essential knowledge and associated skills.
	2.10	Ongoing checks of quality of the work are undertaken in accordance with instructions and established procedures.
3 Complete HV switching procedures to a given schedule	3.1	Work undertaken is checked against works schedule for conformance with requirements and anomalies reported in accordance with established procedures.
	3.2	Accidents and/or injuries are reported in accordance with requirements/established procedures, where applicable.
	3.3	Work site is rehabilitated, cleaned up and made safe in accordance with established procedures.
	3.4	Tools, equipment and any surplus resources and materials are, where appropriate, cleaned, checked and returned to storage in accordance with established procedures.
	3.5	Relevant permit(s) are signed off, safety devices are removed, and the system is re-energised and returned to service in accordance with requirements/established procedures.
	3.6	Works completion records, reports, as installed /modified drawing and/or documentation and information are finalised and processed and appropriate personnel and authority notified.

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Required Skills and Knowledge

REQUIRED SKILLS AND KNOWLEDGE

8) Essential Knowledge and Associated Skills (EKAS): This describes the essential skills and knowledge and their level, required for this unit.

Evidence shall show that knowledge has been acquired of performing high voltage field switching to a given schedule.

All knowledge and skills detailed in this unit should be contextualised to current industry practices and technologies.

KS01-TIS44A High voltage switching

Evidence shall show an understanding of high voltage switching principles to an extent indicated by the following aspects:

T1 Standards, codes, legislation, supply authority regulations and or enterprise requirements applicable to switching of high voltage to a given schedule

T2 Requirements for the use of manuals, system diagrams/plans and drawings encompassing:

- Types, characteristics and capabilities of electrical apparatus
- Use, characteristics and capabilities of specialised tools and testing equipment
- Network interconnectors source of possible backfeed

T3 Role of the HV switching operator

T4 Procedures for obtaining correct HV switching authorisation encompassing:

- Identification of OHS hazards, assessing and controlling risks
- Safety procedures and precautions
- Safe approach distances
- Responsibilities and protocols
- Identifying switching resources
- Procedures for obtaining electrical access permits/authorities
- Requirements for team switching
- Procedures for coordination of operations

T5 Use and operation of equipment associated with HV overhead and substation equipment encompassing:

- Test instruments
- Sticks
- Interrupters
- Arc stranglers

T6 Operation of protection systems and substation equipment

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REQUIRED SKILLS AND KNOWLEDGE

- Note: Examples include fault levels and settings; types and applications; protection systems and substation equipment fault levels and settings; types and applications

T7 Types and categories of HV switchgear

T8 Application, function and operating capabilities of switchgear

T9 Restrictions pertaining to HV switching equipment

T10 Procedures for the isolation of HV transmission main and working earths

T11 Earthing HV electrical apparatus practices and procedures for access encompassing:

- Purposes of Operational and additional work part - on-site earths
- Factors determining the location and effectiveness of Operational earthing
- Acceptable industry procedures
- Personal protective equipment

T12 High voltage switching techniques

- Pre-switching checks
- Switching operational procedures
- Isolation procedures and proving dead/de-energised
- Earthing procedures
- Pre-switching checks
- Switching operational procedures
- Emergency fault procedures
- Energisation procedures

T13 Application and function of SWER system components

- Circuit arrangement
- Principle of operation
- Hazards and procedures associated with faulty SWER earth systems
- Procedure to isolate, energise and commission SWER substations

T14 Operation of HV overhead switching or indicating devices encompassing:

- Identifying hazards, assessing and controlling risks associated with HV switchgear operation
- Systematic and defensive techniques
- Mobile radio procedures
- Double isolation procedures
- Note: Examples include fuses; disconnect fuses; load switching; live line

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REQUIRED SKILLS AND KNOWLEDGE

indicators; capacitors; reclosers; sectionalisers, underslung links, airbreaks; switches, disconnects; live line clamps; phasing sticks; phasing tester

KS02-TIS44A High voltage fault switching principles

Evidence shall show an understanding of high voltage fault switching principles to an extent indicated by the following aspects:

T1 Primary causes, effects and types of HV electrical faults

T2 HV protection devices encompassing:

- Main components
- Types
- Categories
- Applications
- Functions

T3 Basic principle of operation of HV system protection devices

T4 Protection co-ordination and protection ―zoning

T5 HV feeder auto-reclosing suppression encompassing:

- Function
- Application

T6 Circuit condition requirements and switching considerations when paralleling and separating HV feeders

KS03-TIS44A High voltage distribution transformer principles

Evidence shall show an understanding of high voltage distribution transformer principles to an extent indicated by the following aspects:

T1 Operation of HV distribution transformers encompassing:

- Principle governing factors for transformer ratings
- Protection and alarms
- Operating limitations and the relationship between transformer and HV fuse rating
- Purpose and principle operation of HV distribution transformer tap changers
- HV distribution transformer and transformer — cable combination switching practices
- Paralleling requirements
- Isolation and earthing procedures for access
- Common distribution transformer and associated electrical apparatus faults

T2 HV underground switching equipment

- Note: Examples include arc stranglers, switch operation, load break elbows, switching cubicles, canister fuses, bayonet fuses, F and G switching cubicles, voltage indicators and phasing testers

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REQUIRED SKILLS AND KNOWLEDGE

KS04-TIS44A Feeder automation system

Evidence shall show an understanding of feeder automation system to an extent indicated by the following aspects:

T1 Function of feeder automation system and the main components

T2 Operation procedure for a remote field device from a local control station

T3 Functions of ―System Control and Date Acquisition (SCADA) (or any other relevant Data Acquisition and Control) systems and its main components

T4 SCADA system security interlocks and access restrictions

T5 SCADA system operation when switching apparatus or retrieving data via a remote access device such as; Remote Access Terminal (RAT), Dial Up Voice Annunciate System and Local Control Station

T6 Function of the main components of a local/remote control system

T7 Operation of a field devices using SCADA systems via a Remote Access Terminal (RAT), Dial Up Annunciate System and Local Control Station

Evidence Guide

EVIDENCE GUIDE

9) This provides essential advice for assessment of the unit of competency and must be read in conjunction with the Performance Criteria and the range statement of the unit of competency and the Training Package Assessment Guidelines.

The Evidence Guide forms an integral part of this Competency Standard Unit and shall be used in conjunction with all component parts of this unit and, performed in accordance with the Assessment Guidelines of this Training Package.

Overview of Assessment **9.1)**

Longitudinal competency development approaches to assessment, such as Profiling, require data to be reliably gathered in a form that can be consistently interpreted over time. This approach is best utilised in Apprenticeship programs and reduces assessment intervention. It is the Industry's preferred model for apprenticeships. However, where summative (or final) assessment is used it is to include the application of the competency in the normal work environment or, at a minimum, the application of the competency in a realistically simulated work environment. It is

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recognised that, in some circumstances, assessment in part or full can occur outside the workplace. However, it must be in accord with Industry and, Regulatory policy in this regard.

Methods chosen for a particular assessment will be influenced by various factors. These include the extent of the assessment, the most effective locations for the assessment activities to take place, access to physical resources, additional safety measures that may be required and the critical nature of the competencies being assessed.

The critical safety nature of working with electricity, electrical equipment, gas or any other hazardous substance/material carries risk in deeming a person competent. Hence, sources of evidence need to be 'rich' in nature so as to minimise error in judgment.

Activities associated with normal every day work have a bearing on the decision as to how much and how detailed the data gathered will contribute to its 'richness'. Some skills are more critical to safety and operational requirements while the same skills may be more or less frequently practiced. These points are raised for the assessors to consider when choosing an assessment method and developing assessment instruments. Sample assessment instruments are included for Assessors in the Assessment Guidelines of this Training Package.

Critical aspects of evidence required to demonstrate competency in this unit

9.2)

Before the critical aspects of evidence are considered all prerequisites shall be met.

Evidence for competence in this unit shall be considered holistically. Each element and associated Performance Criteria shall be demonstrated on at least two occasions in accordance with the "Assessment Guidelines – UET12". Evidence shall also comprise:

- A representative body of Performance Criteria demonstrated within the timeframes typically expected of the discipline, work function and industrial environment. In particular this shall incorporate evidence that shows a candidate is able to:
  - Implement Occupational Health and Safety workplace procedures and practices including the use of risk control measures as specified in the Performance Criteria and

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range; and

- Apply sustainable energy principles and practices as specified in the Performance Criteria and range; and
- Demonstrate an understanding of the essential knowledge and associated skills as described in this unit to such an extent that the learner's performance outcome is reported in accordance with the preferred approach; namely a percentile graded result, where required by the regulated environment; and
- Demonstrate an appropriate level of employability skills; and

- Conduct work observing the relevant Anti Discrimination legislation, regulations, policies and workplace procedures; and
  - Demonstrated performance across a representative range of contexts from the prescribed items below:

Range of tools/equipment/materials/procedures/workplaces/other variables		
Group No	**The minimum number of items on which skill is to be demonstrated**	**Item List**
A	All of the following:	Approvals/clearances Access permits
B	All of the following:	HV operating sticks HV operating earths HV detectors
C	At least one of the following:	HV phasing sticks HV ground mounted equipment isolating handles and earths
D	At least two of the following:	HV links Air break switches Fuses
E	At least three of the following:	Reclosers Ring main units

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		Circuit breakers Isolators Earth switches Sectionalisers
F	At least one occasion:	Dealing with an unplanned event by drawing on essential knowledge and associated skills to provide appropriate solutions incorporated in the holistic assessment with the above listed items.

Context of and specific resources for assessment **9.3)**

This unit should be assessed as it relates to normal work practice using procedures, information and resources typical of a workplace. This should include:

- OHS policy and work procedures and instructions.
- Suitable work environment, facilities, equipment and materials to undertake actual performance of HV field switching to a given schedule.

In addition to the resources listed above, in Context of and specific resources for assessment, evidence should show demonstrated competency working below ground, in limited spaces, with different structural/construction types and method and in a variety of environments.

Method of assessment **9.4)**

This Competency Standard Unit shall be assessed by methods given in Volume 1, Part 3 “Assessment Guidelines”.

Note:

Competent performance with inherent safe working practices is expected in the Industry to which this Competency Standard Unit

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applies. This requires that the specified essential knowledge and associated skills are assessed in a structured environment which is primarily intended for learning/assessment and incorporates all necessary equipment and facilities for learners to develop and demonstrate the essential knowledge and associated skills described in this unit.

Concurrent assessment and relationship with other units

9.5)

There are no concurrent assessment recommendations for this unit.

Range Statement

RANGE STATEMENT

10) This relates to the unit of competency as a whole providing the range of contexts and conditions to which the Performance Criteria apply. It allows for different work environments and situations that will affect performance.

This Competency Standard Unit shall be demonstrated in relation to the carrying out of high voltage switching operations involving the operation of circuit breaking and isolation devices from a given switching schedule.

Switching operations are confined to those performed in field situations, not in system control rooms or substations and may include electrical load transfer.

Switchgear includes reclosers, ring main units, circuit breakers, isolators, earth switches, sectionalisers, HV links, air break switches, live line clamps, and fuses.

Specialist tools may include HV phasing sticks, HV link sticks, HV live-line clamp operating sticks, HV ground transformer isolating handles and associated earths, HV overhead operating earths and HV detectors.

Switching program/schedule including necessary detail, e.g. structure, switch or equipment number; locations; HV feeder; outage times; works plan/order;

The following constants and variables included in the element/Performance Criteria in this unit are fully described in the Definitions Section 1 of this volume and form an integral part of the Range Statement of this unit:

- Appropriate and relevant persons (see Personnel)
- Appropriate authorities
- Appropriate work platform
- Assessing risk

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RANGE STATEMENT

- Assessment
- Authorisation
- Confined space
- Diagnostic, testing and restoration
- Documenting detail work events, record keeping and or storage of information
- Drawings and specifications
- Emergency
- Environmental and sustainable energy procedures
- Environmental legislation
- Environmental management documentation
- Established procedures
- Fall prevention
- Hazards
- Identifying hazards
- Inspect
- Legislation
- MSDS
- Notification
- OHS practices
- OHS issues
- Permits and/or permits to work
- Personnel
- Quality assurance systems
- Requirements
- Testing procedures
- Work clearance systems

Unit Sector(s)

Not applicable.

Competency Field

Competency Field **11)**

Industry Specific Cross-Discipline Units

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UETTDRIS52A Install and maintain poles, structures and associated hardware

Modification History

Not applicable.

Unit Descriptor

Unit Descriptor **1) Scope:**

1.1) Descriptor

This Competency Standard Unit covers the installation and maintenance of poles and/or structures and associated hardware, other than towers, which may consist of wood, steel, concrete or composite type material. It includes the fixing and or securing of hardware associated as well as the repair and or replacement of poles and or structures used in the distribution and or rail traction industry sectors. It encompasses the implementation of a suitable traffic management plan.

Application of the Unit

Application of the Unit **2)**

This Competency Standard Unit is intended to augment formally acquired competencies. It is suitable for employment-based programs under an approved contract of training.

Licensing/Regulatory Information

License to practice **3)**

The skills and knowledge described in this unit may require a licence/registration to practice in the work place subject to regulations for undertaking of electrical work. Practice in workplace and during training is also subject to regulations directly related to Occupational Health and

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License to practice **3)**

Safety, electricity/telecommunications/gas/water industry safety and compliance, industrial relations, environmental protection, anti discrimination and training. Commonwealth, State/Territory or Local Government legislation and regulations may exist that limits the age of operating certain equipment.

Pre-Requisites

Prerequisite Unit(s) **4)**

Competencies **4.1)**

Granting of competency in this unit shall be made only after competency in the following unit(s) has/have been confirmed.

Where pre-requisite pathways have been identified. All competencies in the Common Unit Group must be have been completed.

Common Unit Group

Unit Code	Unit Title
UEENEEE101A	Apply Occupational Health and Safety regulations, codes and practices in the workplace
UEENEEE102A	Fabricate, assemble and dismantle utilities industry components
UEENEEE105A	Fix and secure electrotechnology equipment
UEENEEE107A	Use drawings, diagrams, schedules, standards, codes and specifications
UETTDREL11A	Apply sustainable energy and environmental procedures
UETTDREL16A	Working safely near live electrical apparatus

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Literacy and numeracy skills **4.2)**

Participants are best equipped to achieve this unit if they have reading, writing and numeracy skills indicated by the following scales. Description of each scale is given in Volume 2, Part 3 “Literacy and Numeracy”

Reading 3 Writing 3 Numeracy 3

Employability Skills Information

Employability Skills **5)**

The required outcomes described in this unit of competency contain applicable facets of Employability Skills. The Employability Skills Summary of the qualification in which this unit of competency is packaged will assist in identifying Employability Skill requirements.

Elements and Performance Criteria Pre-Content

6) Elements describe the essential outcomes of a competency standard unit

Performance Criteria describe the required performance needed to demonstrate achievement of the element. Assessment of performance is to be consistent with the Evidence Guide.

Elements and Performance Criteria

ELEMENT	PERFORMANCE CRITERIA
1 Prepare for the installation and maintenance of poles and/or structures and associated hardware	1.1 Works schedule(s), including drawings, plans, requirements, established procedures, and material lists, are received, analysed and confirmed, if necessary, by site inspection.
	1.2 Relevant requirements and established procedures for the work are communicated to all personnel and identified for all work sites.

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ELEMENT	PERFORMANCE CRITERIA
	1.3 OHS policies and procedures related to requirements and established procedures the installation and maintenance of poles and/or structures and associated hardware are obtained and confirmed for the purposes of the work to be performed and communicated.
	1.4 Work is prioritised and sequenced following consultation with others for completion within acceptable timeframes and in accordance with established procedures.
	1.5 Hazards are identified, OHS risks assessed and control measures are prioritised, implemented and monitored including emergency exits kept clear according to established procedures.
	1.6 Resources including personnel, equipment, tools and personal protective equipment required for the job are obtained and confirmed in working order.
	1.7 Relevant work permits are obtained to access and perform work according to requirements and/or established procedures.
	1.8 Relevant personnel at worksite are confirmed current in First Aid, Pole Top Rescue and other related work procedures according to requirements.
	1.9 Liaison and communication issues with other/authorised personnel, authorities, clients and land owners are resolved to carry out work where necessary.
	1.10 Site is prepared according to the work schedule and to minimise risk and damage to property, commerce, and individuals in accordance with established procedures.
	1.11 Personnel participating in the work, including plant operators and contractors, are fully briefed and respective responsibilities confirmed where applicable in accordance with established procedures.

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ELEMENT	PERFORMANCE CRITERIA	
	1.12	Traffic management plan is identified and implemented.
2 Carry out installation and maintenance of poles and/or structures and associated hardware	2.1	OHS, sustainable energy and environmental principles and practices to reduce the incidents of accidents and minimise waste are monitored and followed in accordance with requirements and/or established procedures.
	2.2	Hazard warnings and safety signs are recognised and hazards and assessed OHS risks are reported to the immediate authorised persons for directions according to established procedures.
	2.3	Lifting, climbing, working aloft, and use of power tools/equipment, techniques and practices are safely followed and, currency according to requirements confirmed.
	2.4	Essential knowledge and associated skills are applied in the safe installation of poles and/or structures and their associated hardware to ensure completion in an agreed timeframe and, to quality standards with a minimum of waste according to requirements.
	2.5	Poles and/or structures and their associated hardware to be installed are stabilised according to requirements.
	2.6	Installation is carried out, in accordance with the work schedule and requirements/established procedures.
	2.7	Maintenance, including repair and/or replacement of poles and/or structures is carried out, in accordance with the work schedule and requirements/established procedures.
	2.8	Unplanned events in the installation of poles and/or structures and associated hardware are undertaken within the scope of established procedures.
	2.9	Known solutions to a variety of problems are applied using acquired essential knowledge and associated skills.

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ELEMENT	PERFORMANCE CRITERIA	
	2.10	Ongoing checks of quality of the work are undertaken in accordance with instructions and established procedures.
3 Complete the installation and maintenance of poles and/or structures and associated hardware.	3.1	Work undertaken is checked against works schedule for conformance with requirements and anomalies reported in accordance with established procedures.
	3.2	Accidents and/or injuries are reported in accordance with requirements/established procedures, where applicable.
	3.3	Work site is rehabilitated, cleaned up and made safe in accordance with established procedures.
	3.4	Tools, equipment and any surplus resources and materials are, where appropriate, cleaned, checked and returned to storage or disposed of in accordance with established procedures.
	3.5	Relevant work permit(s) are signed off and, poles and/or structures and their associated hardware are returned to service in accordance with requirements.
	3.6	Works completion records, reports, as installed /modified drawing and/or documentation and information are finalised and processed and appropriate personnel notified.

Required Skills and Knowledge

REQUIRED SKILLS AND KNOWLEDGE

8) Essential Knowledge and Associated Skills (EKAS): This describes the essential skills and knowledge and their level, required for this unit.

Evidence shall show that knowledge has been acquired of installing and maintaining poles/structures and associated hardware.

All knowledge and skills detailed in this unit should be contextualised to current industry practices and technologies.

KS01-TIS52A Pole and hardware installation and maintenance

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REQUIRED SKILLS AND KNOWLEDGE

Evidence shall show an understanding of the installation of poles and or structures and hardware to an extent indicated by the following aspects:

T1 Standards, codes, legislation, supply authority regulations and or enterprise requirements applicable to installing poles and associated hardware

T2 Requirements for the use of enterprise construction manuals, system diagrams/plans and drawings, encompassing:

- Characteristics and applications of different types of poles and associated hardware

T3 Techniques for installing poles and associated hardware encompassing:

- Types of installation equipment/tools
- Excavation methods
- Types of footings/foundations
- Types of attachments
- Earthing systems
- Clearances between conductors
- Safe methods of erecting and stabling poles and or structures and cross arms

T4 Techniques for maintenance of poles and associated hardware encompassing:

- Stabilisation techniques for unstable poles
- Methods of strengthen poles
- Maintenance and replacement of high voltage insulators and cross arms

T5 Traffic management

- Note: Examples include purpose of traffic management and a power worker's responsibilities in accordance with relevant statutory requirements and electricity supply industry requirements, demonstration of the procedure used to provide an effective traffic management scheme and the use of a two-way radio

T6 Procedures for purchasing/ordering items, removing/dispatching items, stocktaking and record keeping

Evidence Guide

EVIDENCE GUIDE

9) This provides essential advice for assessment of the unit of competency and must be read in conjunction with the Performance Criteria and the range statement of the unit of competency and the Training Package Assessment Guidelines.

The Evidence Guide forms an integral part of this Competency Standard Unit and shall be used in conjunction with all component parts of this unit and, performed in

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EVIDENCE GUIDE

accordance with the Assessment Guidelines of this Training Package.

Overview of Assessment **9.1)**

Longitudinal competency development approaches to assessment, such as Profiling, require data to be reliably gathered in a form that can be consistently interpreted over time. This approach is best utilised in Apprenticeship programs and reduces assessment intervention. It is the Industry's preferred model for apprenticeships. However, where summative (or final) assessment is used it is to include the application of the competency in the normal work environment or, at a minimum, the application of the competency in a realistically simulated work environment. It is recognised that, in some circumstances, assessment in part or full can occur outside the workplace. However, it must be in accord with Industry and, Regulatory policy in this regard.

Methods chosen for a particular assessment will be influenced by various factors. These include the extent of the assessment, the most effective locations for the assessment activities to take place, access to physical resources, additional safety measures that may be required and the critical nature of the competencies being assessed.

The critical safety nature of working with electricity, electrical equipment, gas or any other hazardous substance/material carries risk in deeming a person competent. Hence, sources of evidence need to be 'rich' in nature so as to minimise error in judgment.

Activities associated with normal every day work have a bearing on the decision as to how much and how detailed the data gathered will contribute to its 'richness'. Some skills are more critical to safety and operational requirements while the same skills may be more or less frequently practiced. These points are raised for the assessors to consider when choosing an assessment method and developing assessment instruments. Sample assessment instruments are included for Assessors in the Assessment Guidelines of this Training Package.

Critical aspects of evidence required to demonstrate competency in **9.2)**

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this unit

Before the critical aspects of evidence are considered all prerequisites shall be met.

Evidence for competence in this unit shall be considered holistically. Each element and associated Performance Criteria shall be demonstrated on at least two occasions in accordance with the "Assessment Guidelines – UET12". Evidence shall also comprise:

- A representative body of Performance Criteria demonstrated within the timeframes typically expected of the discipline, work function and industrial environment. In particular this shall incorporate evidence that shows a candidate is able to:
  - Implement Occupational Health and Safety workplace procedures and practices including the use of risk control measures as specified in the Performance Criteria and range; and
  - Apply sustainable energy principles and practices as specified in the Performance Criteria and range; and
  - Demonstrate an understanding of the essential knowledge and associated skills as described in this unit to such an extent that the learner's performance outcome is reported in accordance with the preferred approach; namely a percentile graded result, where required by the regulated environment; and
  - Demonstrate an appropriate level of employability skills; and
- Conduct work observing the relevant Anti Discrimination legislation, regulations, policies and workplace procedures; and
  - Demonstrated performance across a representative range of contexts from the prescribed items below:

Range of tools/equipment/materials/procedures/workplaces/other variables		
Group No	**The minimum number of items on which skill is to be demonstrated**	**Item List**
A	At least one of the following	Wood pole/structure Steel pole/structure Concrete pole/structure

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		Composite pole/structure
B	At least three of the following:	Insulators Cross arm braces Crossarms Pole steps Shackle straps Earth leads Traction supports Traction registration Bonding
C	At least one of the following:	Baulking Stays Concreting including foundation
D	At least one of the following:	Crane Auger/erector ‘A’ frame Lifting beam Pole pikes Helicopter lift
E	At least one occasion	Dealing with an unplanned event by drawing on essential knowledge and associated skills to provide appropriate solutions incorporated in the holistic assessment with the above listed items.

Context of and specific resources for assessment **9.3)**

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This unit should be assessed as it relates to normal work practice using procedures, information and resources typical of a workplace. This should include:

- OHS policy and work procedures and instructions.
- Suitable work environment, facilities, equipment and materials to undertake actual installation of poles and or structures and their associated hardware.

In addition to the resources listed above, in Context of and specific resources for assessment, evidence should show demonstrated competency working below ground, in limited spaces, with different structural/construction types and method and in a variety of environments.

Method of assessment

9.4)

This Competency Standard Unit shall be assessed by methods given in Volume 1, Part 3 “Assessment Guidelines”.

Note:

Competent performance with inherent safe working practices is expected in the Industry to which this Competency Standard Unit applies. This requires that the specified essential knowledge and associated skills are assessed in a structured environment which is primarily intended for learning/assessment and incorporates all necessary equipment and facilities for learners to develop and demonstrate the essential knowledge and associated skills described in this unit.

Concurrent assessment and relationship with other units

9.5)

There are no concurrent assessment recommendations for this unit.

Range Statement

RANGE STATEMENT

10) This relates to the unit of competency as a whole providing the range of contexts

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RANGE STATEMENT

and conditions to which the Performance Criteria apply. It allows for different work environments and situations that will affect performance.

This Competency Standard Unit shall be demonstrated in relation to the installation of poles and or structures which may include basic inspection, removal, repair and replacement of poles and/or structures, including welding, pole staking and rebutting.

Equipment may include:

Pole types and structures may include wood, concrete, steel and composite.

Maintenance may include the basic inspection, removal, repair and replacement of poles including welding, pole staking and rebutting.

Associated hardware includes insulators, crossarms, stays, earth down leads and bond wires, crossarm braces, pole steps, shackle straps and associated bolts and clamps, cantilever assembly, pull off, head span, portal, drop tube

Pole stabilisation techniques include back-fill consolidation, concreting, baulking, reinforcement nailing, approved steel reinforcing and temporary and permanent stay-wires.

Methods of erection may include crane, auger/erector, winch/‘A’ frame, lifting apparatus and helicopter lift.

The following constants and variables included in the element/Performance Criteria in this unit are fully described in the Definitions Section 1 of this volume and form an integral part of the Range Statement of this unit:

- Appropriate and relevant persons (see Personnel)
- Appropriate authorities
- Appropriate work platform
- Assessing risk
- Assessment
- Authorisation
- Confined space
- Diagnostic, testing and restoration
- Documenting detail work events, record keeping and or storage of information
- Drawings and specifications
- Emergency
- Environmental and sustainable energy procedures
- Environmental legislation
- Environmental management documentation
- Established procedures
- Fall prevention
- Hazards

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RANGE STATEMENT

- Identifying hazards
- Inspect
- Legislation
- MSDS
- Notification
- OHS practices
- OHS issues
- Permits and/or permits to work
- Personnel
- Quality assurance systems
- Requirements
- Testing procedures
- Work clearance systems

Unit Sector(s)

Not applicable.

Competency Field

Competency Field **11)**

Industry Specific Cross-Discipline Units

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UETTDRIS54A Install and maintain poles, structures and overhead conductors and cables

Modification History

Not applicable.

Unit Descriptor

Unit Descriptor **1) Scope:**

1.1) Descriptor

This Competency Standard Unit covers the installation and maintenance of overhead conductors and cables used on poles and structures (excluding towers) which includes the stringing, tensioning and terminating of the conductor/cable, as well as the cleaning of insulators (de-energised), the securing of the conductor to the insulators or supports and the undertaking of the electrical connections. It also covers maintenance work associated with the diagnosing of faults, the conducting of visual inspections, the confirmation of phasing and the completion of other enterprise tests. It also encompasses the isolation of systems and circuits, the procedure of issuing/accepting electrical access permits and the updating of system data/maintenance records according to requirements and established procedures.

Application of the Unit

Application of the Unit **2)**

This Competency Standard Unit is intended to augment formally acquired competencies. It is suitable for employment-based programs under an approved contract of training.

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Licensing/Regulatory Information

License to practice **3)**

The skills and knowledge described in this unit may require a licence/registration to practice in the work place subject to regulations for undertaking of electrical work. Practice in workplace and during training is also subject to regulations directly related to Occupational Health and Safety, electricity/telecommunications/gas/water industry safety and compliance, industrial relations, environmental protection, anti discrimination and training. Commonwealth, State/Territory or Local Government legislation and regulations may exist that limits the age of operating certain equipment.

Pre-Requisites

Prerequisite Unit(s) **4)**

Competencies **4.1)**

Granting of competency in this unit shall be made only after competency in the following unit(s) has/have been confirmed.

Where pre-requisite pathways have been identified. All competencies in the Common Unit Group must be have been completed plus all the competencies in one (1) of the identified Pathway Unit Group(s):

Common Unit Group

Unit Code	Unit Title
UEENEEE101A	Apply Occupational Health and Safety regulations, codes and practices in the workplace
UEENEEE102A	Fabricate, assemble and dismantle utilities industry components
UEENEEE105A	Fix and secure electrotechnology equipment
UEENEEE107A	Use drawings, diagrams, schedules, standards, codes and specifications

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Prerequisite Unit(s) **4)**

UETTDREL11A	Apply sustainable energy and environmental procedures
UETTDREL16A	Working safely near live electrical apparatus

Literacy and numeracy skills **4.2)**

Participants are best equipped to achieve this unit if they have reading, writing and numeracy skills indicated by the following scales. Description of each scale is given in Volume 2, Part 3 “Literacy and Numeracy”

Reading 3 Writing 3 Numeracy 3

Employability Skills Information

Employability Skills **5)**

The required outcomes described in this unit of competency contain applicable facets of Employability Skills. The Employability Skills Summary of the qualification in which this unit of competency is packaged will assist in identifying Employability Skill requirements.

Elements and Performance Criteria Pre-Content

6) Elements describe the essential outcomes of a competency standard unit

Performance Criteria describe the required performance needed to demonstrate achievement of the element. Assessment of performance is to be consistent with the Evidence Guide.

Elements and Performance Criteria

ELEMENT **PERFORMANCE CRITERIA**

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ELEMENT	PERFORMANCE CRITERIA	
1 Prepare for the installation and maintenance of overhead conductors and cables used on poles and/or structures	1.1	Plans, requirements, established procedures, and material lists, are received, analysed and confirmed, if necessary, by site inspection.
	1.2	Relevant requirements and established procedures for the work are communicated to all personnel and identified for all work sites.
	1.3	OHS policies and procedures related to requirements and established procedures for the installation and maintenance of overhead conductors and cables used on poles and/or structures are obtained and confirmed for the purposes of the work to be performed and communicated.
	1.4	Work is prioritised and sequenced following consultation with others for completion within acceptable timeframes and in accordance with established procedures.
	1.5	Hazards are identified, OHS risks assessed and control measures are prioritised, implemented and monitored including emergency exits kept clear according to established procedures.
	1.6	Relevant work permits are obtained to access and perform work according to requirements and/or established procedures.
	1.7	Resources including personnel, equipment, tools and personal protective equipment required for the job are obtained and confirmed in working order.
	1.8	Relevant personnel at worksite are confirmed current in First Aid, Pole Top Rescue and other related work procedures according to requirements.
	1.9	Liaison and communication issues with other/authorised personnel, authorities, clients and land owners are resolved to carry out work where necessary.
	1.10	Site is prepared according to the work schedule and to minimise risk and damage to property,

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ELEMENT		PERFORMANCE CRITERIA	
			commerce, and individuals in accordance with established procedures.
		1.11	Personnel participating in the work, including plant operators and contractors, are fully briefed and respective responsibilities confirmed where applicable in accordance with established procedures.
		1.12	Traffic management plan is identified and implemented.
2	Carry out installation and maintenance of overhead conductors and cables used on poles and/or structures	2.1	OHS, sustainable energy and environmental principles and practices to reduce the incidents of accidents and minimise waste are monitored and followed in accordance with requirements and/or established procedures.
		2.2	Lifting, climbing, working aloft, rescue and use of power tools/equipment, techniques and practices are safely followed and, currency according to requirements confirmed.
		2.3	Confirm systems and circuits are isolated as required, proved safe to work on in accordance with the requirements/permits and established procedures.
		2.4	Essential knowledge and associated skills are applied in the safe installation and maintenance of overhead conductors and cables used on poles and/or structures to ensure completion in an agreed timeframe and, to quality standards with a minimum of waste according to requirements.
		2.5	Overhead conductor/cables are strung, tensioned and terminated as per requirements/established procedures.
		2.6	Insulators are cleaned and conductors and anti-vibration devices, spaces/spreaders are secured as per established procedures.
		2.7	Electrical connections are made in accordance with the requirements/established procedures.

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ELEMENT	PERFORMANCE CRITERIA	
	2.8	Maintenance, including repair and/or replacement of overhead conductors and cables used on poles and/or structures is carried out, in accordance with the work schedule and requirements/established procedures.
	2.9	Hazard warnings and safety signs are recognised and hazards and assessed OHS risks are reported to the immediate authorised persons for directions according to established procedures.
	2.10	Unplanned events in the installation and maintenance of overhead conductors and cables used on poles and/or structures are undertaken within the scope of established procedures.
	2.11	Known solutions to a variety of problems are applied using acquired essential knowledge and associated skills.
	2.12	Ongoing checks of quality of the work are undertaken in accordance with instructions and established procedures.
3 Complete the installation and maintenance of overhead conductors and cables used on poles and/or structures	3.1	Work undertaken is checked against works schedule for confirmation of phasing and conformance with requirements and, anomalies reported in accordance with established procedures.
	3.2	Accidents and/or injuries are reported in accordance with requirements/established procedures, where applicable.
	3.3	Work site is rehabilitated, cleaned up and made safe in accordance with established procedures.
	3.4	Tools, equipment and any surplus resources and materials are, where appropriate, cleaned, checked and returned to storage or disposed of in accordance with established procedures.
	3.5	Relevant work permit(s) are signed off and, overhead conductors and cables used on poles and/or structures are returned to service in accordance with requirements.

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ELEMENT	PERFORMANCE CRITERIA
	3.6 Conductors/Cables are tested and commissioned in accordance with enterprise requirements and procedures.
	3.7 Works completion records, reports, as installed /modified drawing and/or documentation and information are finalised and processed and appropriate personnel notified.

Required Skills and Knowledge

REQUIRED SKILLS AND KNOWLEDGE

8) Essential Knowledge and Associated Skills (EKAS): This describes the essential skills and knowledge and their level, required for this unit.

Evidence shall show that knowledge has been acquired of installing and maintaining overhead conductors and cables (poles and structures).

All knowledge and skills detailed in this unit should be contextualised to current industry practices and technologies.

KS01-TIS54A Powerline distribution installation

Evidence shall show an understanding of the installation of overhead distribution conductors to an extent indicated by the following aspects:

T1 Standards, codes, legislation, supply authority regulations and or enterprise requirements applicable to installing conductors and associated equipment

T2 Safe work practices encompassing:

- Requirements to enable safe working on conductive poles
- Procedures to attach on site earthing devices to de-energised low voltage and high voltage circuits

T3 Requirements for the use of overhead line construction manuals, system diagrams/plans and drawings, encompassing:

- Material lists
- Conductor size, type and route length

T4 Constructions types and structures for distribution and sub transmission lines

T5 Types, sizes and characterises of overhead conductors

T6 Resources for the stringing and maintenance of conductors, encompassing:

- Types of low and high voltage overhead electrical conductor connections
- Causes and effects of poor electrical connections

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REQUIRED SKILLS AND KNOWLEDGE

- Reasons for and methods used to maintain standard phase sequencing
- Removing, repairing and replacing of damage conductors
- Minimum clearances between overhead conductors and low and high voltage structures

T7 Techniques for conductor installation encompassing:

- Types and application of tools, equipment and hardware
- Methods of stringing, tensioning and termination of low and high voltage conductors

Evidence Guide

EVIDENCE GUIDE

9) This provides essential advice for assessment of the unit of competency and must be read in conjunction with the Performance Criteria and the range statement of the unit of competency and the Training Package Assessment Guidelines.

The Evidence Guide forms an integral part of this Competency Standard Unit and shall be used in conjunction with all component parts of this unit and, performed in accordance with the Assessment Guidelines of this Training Package.

Overview of Assessment **9.1)**

Longitudinal competency development approaches to assessment, such as Profiling, require data to be reliably gathered in a form that can be consistently interpreted over time. This approach is best utilised in Apprenticeship programs and reduces assessment intervention. It is the Industry's preferred model for apprenticeships. However, where summative (or final) assessment is used it is to include the application of the competency in the normal work environment or, at a minimum, the application of the competency in a realistically simulated work environment. It is recognised that, in some circumstances, assessment in part or full can occur outside the workplace. However, it must be in accord with Industry and, Regulatory policy in this regard.

Methods chosen for a particular assessment will be influenced by various factors. These include the extent of the assessment, the most effective locations for the assessment activities to take place, access to physical resources, additional safety measures that may be required and the critical nature of the competencies being

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assessed.

The critical safety nature of working with electricity, electrical equipment, gas or any other hazardous substance/material carries risk in deeming a person competent. Hence, sources of evidence need to be 'rich' in nature so as to minimise error in judgment.

Activities associated with normal every day work have a bearing on the decision as to how much and how detailed the data gathered will contribute to its 'richness'. Some skills are more critical to safety and operational requirements while the same skills may be more or less frequently practiced. These points are raised for the assessors to consider when choosing an assessment method and developing assessment instruments. Sample assessment instruments are included for Assessors in the Assessment Guidelines of this Training Package.

Critical aspects of evidence required to demonstrate competency in this unit

9.2)

Before the critical aspects of evidence are considered all prerequisites shall be met.

Evidence for competence in this unit shall be considered holistically. Each element and associated Performance Criteria shall be demonstrated on at least two occasions in accordance with the "Assessment Guidelines – UET12". Evidence shall also comprise:

- A representative body of Performance Criteria demonstrated within the timeframes typically expected of the discipline, work function and industrial environment. In particular this shall incorporate evidence that shows a candidate is able to:
  - Implement Occupational Health and Safety workplace procedures and practices including the use of risk control measures as specified in the Performance Criteria and range; and
  - Apply sustainable energy principles and practices as specified in the Performance Criteria and range; and
  - Demonstrate an understanding of the essential knowledge and associated skills as described in this unit to such an extent that the learner's performance outcome is reported in accordance with the preferred approach; namely a percentile graded result, where required by the regulated

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environment; and

- Demonstrate an appropriate level of employability skills; and

- Conduct work observing the relevant Anti Discrimination legislation, regulations, policies and workplace procedures; and
  - Demonstrated performance across a representative range of contexts from the prescribed items below:

Range of tools/equipment/materials/procedures/workplaces/other variables		
Group No	**The minimum number of items on which skill is to be demonstrated**	**Item List**
A	At least two of the following:	Copper Aluminium Steel LV abc Aluminium/steel reinforced HV abc HV iuc Pilot
B	At least two of the following:	EWP Portable platform Ladder
C	At least three of the following:	Tension equipment* Cable drum stands Cable trailers Ropes Rollers Sheaves Stockings Stringing equipment

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		Swivels Winches (* must do one)
D	At least two of the following:	Voltage indicators * Phasing sticks Fault indicators Field intensity meter Operating rods (*must do)
E	Any one of the following:	Lay-out (stringing method) Pull through (stringing method) Pilot rope (stringing method)
F	Any one of the following:	Dynamometer Site board Beat (wave sagging) Abney level Theodolite
G	At least one occasion	Dealing with an unplanned event by drawing on essential knowledge and associated skills to provide appropriate solutions incorporated in the holistic assessment with the above listed items.

Context of and specific resources for assessment **9.3)**

This unit should be assessed as it relates to normal work practice

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using procedures, information and resources typical of a workplace. This should include:

- OHS policy and work procedures and instructions.
- Suitable work environment, facilities, equipment and materials to undertake actual installation and maintenance of overhead conductors and cables on poles and other structures.

In addition to the resources listed above, in Context of and specific resources for assessment, evidence should show demonstrated competency working below ground, in limited spaces, with different structural/construction types and method and in a variety of environments.

Method of assessment

9.4)

This Competency Standard Unit shall be assessed by methods given in Volume 1, Part 3 “Assessment Guidelines”.

Note:

Competent performance with inherent safe working practices is expected in the Industry to which this Competency Standard Unit applies. This requires that the specified essential knowledge and associated skills are assessed in a structured environment which is primarily intended for learning/assessment and incorporates all necessary equipment and facilities for learners to develop and demonstrate the essential knowledge and associated skills described in this unit.

Concurrent assessment and relationship with other units

9.5)

There are no concurrent assessment recommendations for this unit.

Range Statement

RANGE STATEMENT

10) This relates to the unit of competency as a whole providing the range of contexts and conditions to which the Performance Criteria apply. It allows for different work

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RANGE STATEMENT

environments and situations that will affect performance.

This Competency Standard Unit shall be demonstrated in relation to the installation and maintenance of overhead conductors and cables used on poles and structures.

Installation and maintenance may include the stringing, tensioning, terminating of the conductor/cable and the removal, repair and replacement of cables, conductors and associated hardware and includes the cleaning of insulators. May include pre-energised/energisation checks and tests. Visual inspections, diagnosing maintenance work associated with the fault diagnosis, conducting of visual inspections, confirmation of phasing, and the completion of other enterprise tests is also included. It also encompasses the isolation of systems and circuits, the procedure of issuing/accepting electrical access permits and the updating of system data/maintenance records according to requirements and established procedures.

Structures include poles and columns.

Types of conductor include copper, aluminium, steel, aluminium conductor steel reinforced (ACSR), low voltage aerial bundled cable (LVABC), high voltage aerial bundled cable (HVABC), insulated unscreened cable (IUC), service cable and fibre optic, pilot and control cables.

Overhead systems include their associated earthing systems, e.g. MEN and CMEN LV systems, bridging/bonding and conventional and SWER HV systems.

Plant may include elevating work platform, winches and capstans, specialist tension stringing equipment, cable trailers and cable drum stands.

Testing and recording equipment (LV) includes voltage detectors, tong ammeters, polarity testers, insulation resistance testers, recording meters and phase sequence indicators.

Testing and recording equipment (HV) includes phasing sticks, fault indicators, radio frequency interference detectors and voltage detectors.

The following constants and variables included in the element/Performance Criteria in this unit are fully described in the Definitions Section 1 of this volume and form an integral part of the Range Statement of this unit:

- Appropriate and relevant persons (see Personnel)
- Appropriate authorities
- Appropriate work platform
- Assessing risk
- Assessment
- Authorisation
- Confined space
- Diagnostic, testing and restoration
- Documenting detail work events, record keeping and or storage of information
- Drawings and specifications

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RANGE STATEMENT

- Emergency
- Environmental and sustainable energy procedures
- Environmental legislation
- Environmental management documentation
- Established procedures
- Fall prevention
- Hazards
- Identifying hazards
- Inspect
- Legislation
- MSDS
- Notification.
- OHS practices
- OHS issues
- Permits and/or permits to work
- Personnel
- Quality assurance systems
- Requirements
- Testing procedures
- Work clearance systems

Unit Sector(s)

Not applicable.

Competency Field

Competency Field **11)**

Industry Specific Cross-Discipline Units

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UETTDRIS55A Install and maintain low voltage underground services

Modification History

Not applicable.

Unit Descriptor

Unit Descriptor **1) Scope:**

1.1) Descriptor

This Competency Standard Unit covers the installation, maintenance and connection of low voltage underground service lines and associated equipment (between the connection point and the point of supply - customers' premises). Maintenance includes the repair and replacement of service cables, service fuses and the replacement and repair of service hardware, the identification and rectification of faults. It also covers insulation, voltage, polarity testing and phase rotation.

Application of the Unit

Application of the Unit **2)**

This Competency Standard Unit is intended to augment formally acquired competencies. It is suitable for employment-based programs under an approved contract of training.

Licensing/Regulatory Information

License to practice **3)**

The skills and knowledge described in this unit may require a licence/registration to practice in the work place subject to regulations for undertaking of electrical work. Practice in workplace and during training is also subject to regulations directly related to Occupational Health and

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License to practice **3)**

Safety, electricity/telecommunications/gas/water industry safety and compliance, industrial relations, environmental protection, anti discrimination and training. Commonwealth, State/Territory or Local Government legislation and regulations may exist that limits the age of operating certain equipment.

Pre-Requisites

Prerequisite Unit(s) **4)**

Competencies **4.1)**

Granting of competency in this unit shall be made only after competency in the following unit(s) has/have been confirmed.

Where pre-requisite pathways have been identified. All competencies in the Common Unit Group must be have been completed plus all the competencies in one (1) of the identified Pathway Unit Group(s):

Transmission Overhead

Distribution Overhead

Rail Traction

Distribution Cable Jointing

Electrotechnology Electrician

Common Unit Group

Unit Code	Unit Title
UEENEEE101A	Apply Occupational Health and Safety regulations, codes and practices in the workplace
UEENEEE102A	Fabricate, assemble and dismantle utilities industry components
UEENEEE104A	Solve problems in d.c. Circuits
UEENEEE105A	Fix and secure electrotechnology equipment

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Prerequisite Unit(s) **4)**

UEENEEE107A	Use drawings, diagrams, schedules, standards, codes and specifications
UEENEEG101A	Solve problems in electromagnetic devices and related circuits
UEENEEG102A	Solve problems in low voltage a.c. Circuits
UETTDREL16A	Working safely near live electrical apparatus

Transmission Overhead Pathway Group

Unit Code	Unit Title
UETTDREL11A	Apply sustainable energy and environmental procedures
UETTDREL12A	Operate plant and equipment near live electrical conductors and apparatus
UETTDRIS54A	Install and maintain poles, structures, overhead conductors and cables
UETTDRTP26A	Install transmission structures and associated hardware
UETTDRTP27A	Maintain transmission structures and associated hardware
UETTDRTP29A	Install and maintain transmission overhead conductors and cables

Distribution Overhead Pathway Group

Unit Code	Unit Title
UETTDRDP12A	Maintain overhead energised low voltage conductors and cables
UETTDREL11A	Apply sustainable energy and environmental procedures
UETTDREL12A	Operate plant and equipment near live electrical conductors and apparatus
UETTDRIS41A	Install network infrastructure electrical

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Prerequisite Unit(s) **4)**

	equipment
UETTDRIS42A	Maintain network infrastructure electrical equipment
UETTDRIS52A	Install and maintain poles, structures and associated hardware
UETTDRIS54A	Install and maintain poles, structures, overhead conductors and cables
UETTDRIS56A	Install and maintain low voltage overhead services

Rail Traction Pathway Group

Unit Code	Unit Title
UETTDREL11A	Apply sustainable energy and environmental procedures
UETTDREL12A	Operate plant and equipment near live electrical conductors and apparatus
UETTDRIS52A	Install and maintain poles, structures and associated hardware
UETTDRIS54A	Install and maintain poles, structures, overhead conductors and cables
UETTDRRT21A	Install traction overhead wiring systems
UETTDRRT22A	Maintain traction overhead wiring systems
UETTDRRT23A	Install rail traction bonds
UETTDRRT27A	Install overhead traction components and equipment
UETTDRRT28A	Maintain overhead traction components and equipment

Distribution Cable Jointing Pathway Group

Unit Code	Unit Title

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Prerequisite Unit(s) **4)**

UETTDRCJ21A	Lay ESI electrical cables
UETTDRCJ26A	Install and maintain de-energised low voltage underground polymeric cables.
UETTDRCJ27A	Install and maintain de-energised high voltage underground polymeric cables.
UETTDREL11A	Apply sustainable energy and environmental procedures
UETTDREL12A	Operate plant and equipment near live electrical conductors and apparatus

Electrotechnology Electrician Pathway Group

Unit Code	Unit Title
UEENEEE137A	Document and apply measures to control OHS risks associated with electrotechnology work
UEENEEG006A	Solve problems in single and three phase low voltage machines
UEENEEG033A	Solve problems in single and three phase electrical apparatus and circuits
UEENEEG063A	Arrange circuits, control and protection for general electrical installations
UEENEEG106A	Terminate cables, cords and accessories for low voltage circuits
UEENEEG108A	Trouble-shoot and repair faults in low voltage electrical apparatus and circuits
UEENEEG109A	Develop and connect electrical control circuits
UEENEEK142A	Apply environmentally and sustainable energy procedures in the energy sector
UETTDRIS67A	Solve problems in energy supply network equipment

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Literacy and numeracy skills **4.2)**

Participants are best equipped to achieve this unit if they have reading, writing and numeracy skills indicated by the following scales. Description of each scale is given in Volume 2, Part 3 “Literacy and Numeracy”

Reading 3 Writing 3 Numeracy 3

Employability Skills Information

Employability Skills **5)**

The required outcomes described in this unit of competency contain applicable facets of Employability Skills. The Employability Skills Summary of the qualification in which this unit of competency is packaged will assist in identifying Employability Skill requirements.

Elements and Performance Criteria Pre-Content

6) Elements describe the essential outcomes of a competency standard unit

Performance Criteria describe the required performance needed to demonstrate achievement of the element. Assessment of performance is to be consistent with the Evidence Guide.

Elements and Performance Criteria

ELEMENT	PERFORMANCE CRITERIA
1 Prepare for the installation and maintenance of LV underground services and associated equipment	1.1 Works schedule(s), including drawings, plans, requirements, established procedures, and material lists, are received, analysed and confirmed, if necessary, by site inspection.
	1.2 Relevant requirements and established procedures for the work are communicated to all personnel and identified for all work sites.

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ELEMENT	PERFORMANCE CRITERIA
	1.3 OHS policies and procedures related to requirements and established procedures for the installation and maintenance of LV underground services and associated equipment are obtained and confirmed for the purposes of the work to be performed and communicated.
	1.4 Work is prioritised and sequenced following consultation with others for completion within acceptable timeframes and in accordance with established procedures.
	1.5 Hazards are identified, OHS risks assessed and control measures are prioritised, implemented and monitored including emergency exits kept clear according to established procedures.
	1.6 Relevant work permits are obtained to access and perform work according to requirements and/or established procedures.
	1.7 Resources including personnel, equipment, tools and personal protective equipment required for the job are obtained and confirmed in working order.
	1.8 Relevant personnel at worksite are confirmed current in First Aid, Rescue and other related work procedures according to requirements.
	1.9 Liaison and communication issues with other/authorised personnel, authorities, clients and land owners are resolved to carry out work where necessary.
	1.10 Site is prepared according to the work schedule and to minimise risk and damage to property, commerce, and individuals in accordance with established procedures
	1.11 Personnel participating in the work, including plant operators and contractors, are fully briefed and respective responsibilities confirmed where applicable in accordance with established procedures.
	1.12 Road signs, barriers and warning devices are

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ELEMENT	PERFORMANCE CRITERIA	
		positioned in accordance with requirements.
2 Carry out installation and maintenance of LV underground services and associated equipment	2.1	OHS and sustainable energy principles and practices to reduce the incidents of accidents and minimise waste are monitored and followed in accordance with requirements and/or established procedures.
	2.2	Lifting, climbing, working in confined spaces and aloft, and use of power tools/equipment, techniques and practices are safely followed and, currency according to requirements confirmed.
	2.3	Essential knowledge and associated skills are applied in the safe installation and maintenance of LV underground services and associated equipment to ensure completion to quality standards with a minimum of waste according to requirements.
	2.4	LV underground services and associated equipment are installed according to the work schedule and requirements/established procedures.
	2.5	Maintenance, including repair and/or replacement of LV services and associated equipment is carried out, in accordance with the work schedule and requirements/established procedures.
	2.6	Hazard warnings and safety signs are recognised and hazards and assessed OHS risks are reported to the immediate authorised persons for directions according to established procedures.
	2.7	Unplanned events during the installation and maintenance of LV services and associated equipment are undertaken within the scope of established procedures.
	2.8	Known solutions to a variety of problems are applied using acquired essential knowledge and associated skills.
	2.9	Ongoing checks of quality of the work are undertaken in accordance with instructions and

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ELEMENT	PERFORMANCE CRITERIA	
		established procedures.
3 Complete the installation and maintenance of LV underground services and associated equipment	3.1	Work undertaken is checked/tested against works schedule for conformance with requirements and anomalies reported in accordance with established procedures.
	3.2	Accidents and/or injuries are reported in accordance with requirements/established procedures, where applicable.
	3.3	Work site is rehabilitated, cleaned up and made safe in accordance with established procedures.
	3.4	Tools, equipment and any surplus resources and materials are, where appropriate, cleaned, checked and returned to storage in accordance with established procedures.
	3.5	Relevant work permit(s) are signed off and, the LV services and associated equipment are returned to service in accordance with requirements.
	3.6	Works completion records, reports, as installed /modified drawing and/or documentation and information are finalised and processed and appropriate personnel notified.

Required Skills and Knowledge

REQUIRED SKILLS AND KNOWLEDGE

8) Essential Knowledge and Associated Skills (EKAS): This describes the essential skills and knowledge and their level, required for this unit.

Evidence shall show that knowledge has been acquired of installing and maintaining low voltage services (underground).

All knowledge and skills detailed in this unit should be contextualised to current industry practices and technologies.

KS01-TIS55A Low voltage electrical underground service installation

Evidence shall show an understanding of the installation of low voltage electrical services to an extent indicated by the following aspects:

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REQUIRED SKILLS AND KNOWLEDGE

T1 Standards, codes, legislation, supply authority regulations and or enterprise requirements

T2 Requirements for the use of enterprise construction manuals, system diagrams/plans and drawings, encompassing:

- Types of low voltage underground services
- Methods of construction and installation
- Minimum depths for underground services to be buried and proximity to other assets and structures

T3 Installation equipment/tools

- Equipment and tools for underground service installation
- Fittings and hardware for underground service installation

T4 Methods of laying cables including:

- Conduits and sand and slabbing

T5 Characteristics and applications of different types of cables encompassing:

- Cable cross-sectional area of conductors
- Current rating and fuse types and ratings

T6 Techniques for maintenance of service installations encompassing:

- Diagnosis and repair of faults

T7 Jointing and terminating methods encompassing:

- Polymeric heat-shrink materials
- Polymeric tape materials
- Insulated piercing connectors (IPCs)
- Energised and de-energised cables
- Connections to point of entry, fuse boxes, pillars, pits

T8 Testing and commissioning procedures encompassing:

- Pre-energising tests - insulation resistance and continuity test
- Inspection
- Equipment functionality tests
- Polarity, voltage and phase sequence tests
- Neutral and phase identification tests
- Neutral integrity tests
- Meter function test
- Testing check forms

T9 Connection principles:

- Purpose and function of MEN system
- Types of connection faults
- Causes and effects of incorrect and poor electrical connections

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REQUIRED SKILLS AND KNOWLEDGE

- Principles of loop impedance
- Reasons for and methods used to maintain standard phase sequencing
- Purpose and operation of service fusing
- Use of independent earth for testing

Evidence Guide

EVIDENCE GUIDE

9) This provides essential advice for assessment of the unit of competency and must be read in conjunction with the Performance Criteria and the range statement of the unit of competency and the Training Package Assessment Guidelines.

The Evidence Guide forms an integral part of this Competency Standard Unit and shall be used in conjunction with all component parts of this unit and, performed in accordance with the Assessment Guidelines of this Training Package.

Overview of Assessment **9.1)**

Longitudinal competency development approaches to assessment, such as Profiling, require data to be reliably gathered in a form that can be consistently interpreted over time. This approach is best utilised in Apprenticeship programs and reduces assessment intervention. It is the Industry's preferred model for apprenticeships. However, where summative (or final) assessment is used it is to include the application of the competency in the normal work environment or, at a minimum, the application of the competency in a realistically simulated work environment. It is recognised that, in some circumstances, assessment in part or full can occur outside the workplace. However, it must be in accord with Industry and, Regulatory policy in this regard.

Methods chosen for a particular assessment will be influenced by various factors. These include the extent of the assessment, the most effective locations for the assessment activities to take place, access to physical resources, additional safety measures that may be required and the critical nature of the competencies being assessed.

The critical safety nature of working with electricity, electrical equipment, gas or any other hazardous substance/material carries risk in deeming a person competent. Hence, sources of evidence

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need to be ‘rich’ in nature so as to minimise error in judgment.

Activities associated with normal every day work have a bearing on the decision as to how much and how detailed the data gathered will contribute to its ‘richness’. Some skills are more critical to safety and operational requirements while the same skills may be more or less frequently practiced. These points are raised for the assessors to consider when choosing an assessment method and developing assessment instruments. Sample assessment instruments are included for Assessors in the Assessment Guidelines of this Training Package.

Critical aspects of evidence required to demonstrate competency in this unit

9.2)

Before the critical aspects of evidence are considered all prerequisites shall be met.

Evidence for competence in this unit shall be considered holistically. Each element and associated Performance Criteria shall be demonstrated on at least two occasions in accordance with the “Assessment Guidelines – UET12”. Evidence shall also comprise:

- A representative body of Performance Criteria demonstrated within the timeframes typically expected of the discipline, work function and industrial environment. In particular this shall incorporate evidence that shows a candidate is able to:
  - Implement Occupational Health and Safety workplace procedures and practices including the use of risk control measures as specified in the Performance Criteria and range; and
  - Apply sustainable energy principles and practices as specified in the Performance Criteria and range; and
  - Demonstrate an understanding of the essential knowledge and associated skills as described in this unit to such an extent that the learner’s performance outcome is reported in accordance with the preferred approach; namely a percentile graded result, where required by the regulated environment; and
  - Demonstrate an appropriate level of employability skills; and
- Conduct work observing the relevant Anti Discrimination

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legislation, regulations, policies and workplace procedures; and

- Demonstrated performance across a representative range of contexts from the prescribed items below:

Range of tools/equipment/materials/procedures/workplaces/other variables		
Group No	**The minimum number of items on which skill is to be demonstrated**	**Item List**
A	At least two of the following:	Underground pillar/pit connection (single phase) Underground pillar/pit connection (three phase*) Underground to overhead connection (* must do)
B	At least one of the following:	Fuse units Circuit breakers Service links
C	At least four of the following:	Polarity test * Phase rotation test Continuity test Voltage test Insulation resistance test (* must do)
D	At least one of the following:	Aluminium LV cable XLPE cable Copper LV cable
E	At least one occasion	Dealing with an unplanned event by drawing on essential knowledge and

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		associated skills to provide appropriate solutions incorporated in the holistic assessment with the above listed items.

Context of and specific resources for assessment **9.3)**

This unit should be assessed as it relates to normal work practice using procedures, information and resources typical of a workplace. This should include:

- OHS policy and work procedures and instructions.
- Suitable work environment, facilities, equipment and materials to undertake actual installation and maintenance of underground LV services.

In addition to the resources listed above, in Context of and specific resources for assessment, evidence should show demonstrated competency working below ground, in limited spaces, with different structural/construction types and method and in a variety of environments.

Method of assessment **9.4)**

This Competency Standard Unit shall be assessed by methods given in Volume 1, Part 3 “Assessment Guidelines”.

Note:

Competent performance with inherent safe working practices is expected in the Industry to which this Competency Standard Unit applies. This requires that the specified essential knowledge and associated skills are assessed in a structured environment which is primarily intended for learning/assessment and incorporates all necessary equipment and facilities for learners to develop and demonstrate the essential knowledge and associated skills described in this unit.

Concurrent **9.5)**

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assessment and relationship with other units

There are no concurrent assessment recommendations for this unit.

Range Statement

RANGE STATEMENT

10) This relates to the unit of competency as a whole providing the range of contexts and conditions to which the Performance Criteria apply. It allows for different work environments and situations that will affect performance.

This Competency Standard Unit shall be demonstrated in relation to the installation and maintenance of underground low voltage services as they relate to distribution circuits and associated equipment and includes the identification of faults.

Installation may include, the laying and connection of service cables, connection of the service cable to underground equipment, the fitting and connection of fuses or circuit breakers and the testing and commissioning of the service

Service includes the connection between the customers' point of supply and the underground pillar/pit connection (single phase), underground pillar/pit connection (three phase) and or underground to overhead connection.

Maintenance may include the identification and diagnosis of faults, the removal, replacement or repair of service cables and associated hardware and the temporary installation of services and associated equipment and the testing and commissioning of the service.

Testing procedures may include continuity, polarity, phase rotation, insulation resistance and voltage.

Testing equipment may include, digital/analogue voltage testers, multimeters, phase rotation testers, load testers, insulation resistance and continuity testers.

Associated hardware may include fuse units, circuit breakers, contactors, mains connection boxes.

The following constants and variables included in the element/Performance Criteria in this unit are fully described in the Definitions Section 1 of this volume and form an integral part of the Range Statement of this unit:

- Appropriate and relevant persons (see Personnel)
- Appropriate authorities
- Appropriate work platform
- Assessing risk
- Assessment
- Authorisation

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RANGE STATEMENT

- Confined space
- Diagnostic, testing and restoration
- Documenting detail work events, record keeping and or storage of information
- Drawings and specifications
- Emergency
- Environmental and sustainable energy procedures
- Environmental legislation
- Environmental management documentation
- Established procedures
- Fall prevention
- Hazards
- Identifying hazards
- Inspect
- Legislation
- MSDS
- Notification.
- OHS practices
- OHS issues
- Permits and/or permits to work
- Personnel
- Quality assurance systems
- Requirements
- Testing procedures
- Work clearance systems

Unit Sector(s)

Not applicable.

Competency Field

Competency Field **11)**

Industry Specific Cross-Discipline Units

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UETTDRIS56A Install and maintain low voltage overhead services

Modification History

Not applicable.

Unit Descriptor

Unit Descriptor **1) Scope:**

1.1) Descriptor

This Competency Standard Unit covers the installation, maintenance and connection of low voltage overhead service lines and associated equipment (between the connection point and the point of supply - customers' premises). Maintenance includes the repair and replacement of service cables, service fuses and the replacement and repair of service hardware, the identification and rectification of faults. It also covers insulation, voltage, polarity testing and phase rotation.

Application of the Unit

Application of the Unit **2)**

This Competency Standard Unit is intended to augment formally acquired competencies. It is suitable for employment-based programs under an approved contract of training.

Licensing/Regulatory Information

License to practice **3)**

The skills and knowledge described in this unit may require a licence/registration to practice in the work place subject to regulations for undertaking of electrical work. Practice in workplace and during training is also subject to regulations directly related to Occupational Health and

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License to practice **3)**

Safety, electricity/telecommunications/gas/water industry safety and compliance, industrial relations, environmental protection, anti discrimination and training. Commonwealth, State/Territory or Local Government legislation and regulations may exist that limits the age of operating certain equipment.

Pre-Requisites

Prerequisite Unit(s) **4)**

Competencies **4.1)**

Granting of competency in this unit shall be made only after competency in the following unit(s) has/have been confirmed.

Where pre-requisite pathways have been identified. All competencies in the Common Unit Group must be have been completed plus all the competencies in one (1) of the identified Pathway Unit Group(s):

Transmission Overhead

Distribution Overhead

Rail Traction

Distribution Cable Jointing

Electrotechnology Electrician

Common Unit Group

Unit Code	Unit Title
UEENEEE101A	Apply Occupational Health and Safety regulations, codes and practices in the workplace
UEENEEE102A	Fabricate, assemble and dismantle utilities industry components
UEENEEE104A	Solve problems in d.c. Circuits
UEENEEE105A	Fix and secure electrotechnology equipment

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Prerequisite Unit(s) **4)**

UEENEEE107A	Use drawings, diagrams, schedules, standards, codes and specifications
UEENEEG101A	Solve problems in electromagnetic devices and related circuits
UEENEEG102A	Solve problems in low voltage a.c. Circuits
UETTDREL16A	Working safely near live electrical apparatus

Transmission Overhead Pathway Group

Unit Code	Unit Title
UETTDREL11A	Apply sustainable energy and environmental procedures
UETTDREL12A	Operate plant and equipment near live electrical conductors and apparatus
UETTDRIS54A	Install and maintain poles, structures, overhead conductors and cables
UETTDRTP26A	Install transmission structures and associated hardware
UETTDRTP27A	Maintain transmission structures and associated hardware
UETTDRTP29A	Install and maintain transmission overhead conductors and cables

Distribution Overhead Pathway Group

Unit Code	Unit Title
UETTDRDP12A	Maintain overhead energised low voltage conductors and cables
UETTDREL11A	Apply sustainable energy and environmental procedures
UETTDREL12A	Operate plant and equipment near live electrical conductors and apparatus

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Prerequisite Unit(s) **4)**

UETTDRIS52A	Install and maintain poles, structures and associated hardware
UETTDRIS54A	Install and maintain poles, structures, overhead conductors and cables

Rail Traction Pathway Group

Unit Code	Unit Title
UETTDREL11A	Apply sustainable energy and environmental procedures
UETTDREL12A	Operate plant and equipment near live electrical conductors and apparatus
UETTDRIS52A	Install and maintain poles, structures and associated hardware
UETTDRIS54A	Install and maintain poles, structures, overhead conductors and cables
UETTDRRT21A	Install traction overhead wiring systems
UETTDRRT22A	Maintain traction overhead wiring systems
UETTDRRT23A	Install rail traction bonds
UETTDRRT27A	Install overhead traction components and equipment
UETTDRRT28A	Maintain overhead traction components and equipment

Distribution Cable Jointing Pathway Group

Unit Code	Unit Title
UETTDRCJ21A	Lay ESI electrical cables
UETTDRCJ26A	Install and maintain de-energised low voltage underground polymeric cables.
UETTDRCJ27A	Install and maintain de-energised

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Prerequisite Unit(s) **4)**

	high voltage underground polymeric cables.
UETTDREL11A	Apply sustainable energy and environmental procedures
UETTDREL12A	Operate plant and equipment near live electrical conductors and apparatus
UETTDRIS41A	Install network infrastructure electrical equipment
UETTDRIS42A	Maintain network infrastructure electrical equipment
UETTDRIS55A	Install and maintain low voltage underground services

Electrotechnology Electrician Pathway Group

Unit Code	Unit Title
UEENEEE137A	Document and apply measures to control OHS risks associated with electrotechnology work
UEENEEG006A	Solve problems in single and three phase low voltage machines
UEENEEG033A	Solve problems in single and three phase electrical apparatus and circuits
UEENEEG063A	Arrange circuits, control and protection for general electrical installations
UEENEEG106A	Terminate cables, cords and accessories for low voltage circuits
UEENEEG108A	Trouble-shoot and repair faults in low voltage electrical apparatus and circuits
UEENEEG109A	Develop and connect electrical control circuits
UEENEEK142A	Apply environmentally and

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Prerequisite Unit(s)	**4)**	
		sustainable energy procedures in the energy sector
	UETTDRIS67A	Solve problems in energy supply network equipment

Literacy and numeracy skills **4.2)**

Participants are best equipped to achieve this unit if they have reading, writing and numeracy skills indicated by the following scales. Description of each scale is given in Volume 2, Part 3 “Literacy and Numeracy”

Reading 3 Writing 3 Numeracy 3

Employability Skills Information

Employability Skills **5)**

The required outcomes described in this unit of competency contain applicable facets of Employability Skills. The Employability Skills Summary of the qualification in which this unit of competency is packaged will assist in identifying Employability Skill requirements.

Elements and Performance Criteria Pre-Content

6) Elements describe the essential outcomes of a competency standard unit	Performance Criteria describe the required performance needed to demonstrate achievement of the element. Assessment of performance is to be consistent with the Evidence Guide.

Elements and Performance Criteria

ELEMENT	**PERFORMANCE CRITERIA**

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ELEMENT	PERFORMANCE CRITERIA	
1 Prepare for the installation and maintenance of LV overhead services and associated equipment	1.1	Works schedule(s), including drawings, plans, requirements, established procedures, and material lists, are received, analysed and confirmed, if necessary, by site inspection.
	1.2	Relevant requirements and established procedures for the work are communicated to all personnel and identified for all work sites.
	1.3	OHS policies and procedures related to requirements and established procedures for the installation and maintenance of LV overhead services and associated equipment are obtained and confirmed for the purposes of the work to be performed and communicated.
	1.4	Work is prioritised and sequenced following consultation with others for completion within acceptable timeframes and in accordance with established procedures.
	1.5	Hazards are identified, OHS risks assessed and control measures are prioritised, implemented and monitored including emergency exits kept clear according to established procedures.
	1.6	Relevant work permits are obtained to access and perform work according to requirements and/or established procedures.
	1.7	Resources including personnel, equipment, tools and personal protective equipment required for the job are obtained and confirmed in working order.
	1.8	Relevant personnel at worksite are confirmed current in First Aid, Pole Top Rescue and other related work procedures according to requirements.
	1.9	Liaison and communication issues with other/authorised personnel, authorities, clients and land owners are resolved to carry out work where necessary.
	1.10	Site is prepared according to the work schedule and to minimise risk and damage to property,

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ELEMENT		PERFORMANCE CRITERIA	
			commerce, and individuals in accordance with established procedures.
		1.11	Personnel participating in the work, including plant operators and contractors, are fully briefed and respective responsibilities confirmed where applicable in accordance with established procedures.
		1.12	Road signs, barriers and warning devices are positioned in accordance with requirements.
2	Carry out installation and maintenance of LV overhead services and associated equipment	2.1	OHS and sustainable energy principles and practices to reduce the incidents of accidents and minimise waste are monitored and followed in accordance with requirements and/or established procedures.
		2.2	Lifting, climbing, working aloft, and use of power tools/equipment, techniques and practices are safely followed and, currency according to requirements confirmed.
		2.3	Essential knowledge and associated skills are applied in the safe installation and maintenance of LV overhead services and associated equipment to ensure completion to quality standards with a minimum of waste according to requirements.
		2.4	LV overhead services and associated equipment are installed according to the work schedule and requirements/established procedures.
		2.5	Maintenance, including repair and/or replacement of LV overhead services and associated equipment is carried out, in accordance with the work schedule and requirements/established procedures.
		2.6	Hazard warnings and safety signs are recognised and hazards and assessed OHS risks are reported to the immediate authorised persons for directions according to established procedures.
		2.7	Unplanned events during the installation and maintenance of LV services and associated

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ELEMENT	PERFORMANCE CRITERIA	
		equipment are undertaken within the scope of established procedures.
	2.8	Known solutions to a variety of problems are applied using acquired essential knowledge and associated skills.
	2.9	Ongoing checks of quality of the work are undertaken in accordance with instructions and established procedures.
3 Complete the installation and maintenance of LV overhead services and associated equipment	3.1	Work undertaken is checked/tested against works schedule for conformance with requirements and anomalies reported in accordance with established procedures.
	3.2	Accidents and/or injuries are reported in accordance with requirements/established procedures, where applicable.
	3.3	Work site is rehabilitated, cleaned up and made safe in accordance with established procedures.
	3.4	Tools, equipment and any surplus resources and materials are, where appropriate, cleaned, checked and returned to storage in accordance with established procedures.
	3.5	Relevant work permit(s) are signed off and, the LV overhead services and associated equipment are returned to service in accordance with requirements.
	3.6	Works completion records, reports, as installed /modified drawing and/or documentation and information are finalised and processed and appropriate personnel notified.

Required Skills and Knowledge

REQUIRED SKILLS AND KNOWLEDGE

8) Essential Knowledge and Associated Skills (EKAS): This describes the essential skills and knowledge and their level, required for this unit.

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REQUIRED SKILLS AND KNOWLEDGE

Evidence shall show that knowledge has been acquired of installing and maintaining low voltage services (overhead).

All knowledge and skills detailed in this unit should be contextualised to current industry practices and technologies.

KS01-TIS56A Low voltage electrical overhead service installation

Evidence shall show an understanding of the installation of low voltage electrical services to an extent indicated by the following aspects:

T1 Standards, codes, legislation, supply authority regulations and or enterprise requirements

T2 Requirements for the use of enterprise construction manuals, system diagrams/plans and drawings, encompassing:

- Types of low voltage overhead services
- Methods of construction and installation
- Minimum clearances for overhead services to assets and structures
- Ground clearances for overhead services
- Maximum span lengths and tensions for overhead services
- Customer poles

T3 Installation equipment/tools

- Equipment and tools for overhead service installation
- Fittings and hardware for overhead service installation

T4 Characteristics and applications of different types of cables encompassing:

- Cable cross-sectional area of conductors
- Current rating and fuse types and ratings

T5 Stringing and terminating methods encompassing:

- Energised and de-energised cables
- Connections to point of attachment, fuse boxes and pole top boxes
- Termination at customer pole

T6 Connection of overhead services:

- Types of overhead service connections
- Live low voltage work principles

T7 Techniques for maintenance of overhead service installations encompassing:

- Diagnosis and repair of faults
- Removing, repairing and replacing of damaged overhead services
- Removing and replacing pole type fuses

T8 Testing and commissioning procedures encompassing:

- Inspection

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REQUIRED SKILLS AND KNOWLEDGE

- Equipment functionality tests
- Continuity tests
- Polarity, voltage and phase sequence tests
- Neutral and phase identification tests
- Neutral integrity tests
- Meter function test
- Testing check forms

T9 Connection principles:

- Purpose and function of MEN system
- Types of connection faults
- Causes and effects of incorrect and poor electrical connections
- Principles of loop impedance
- Reasons for and methods used to maintain standard phase sequencing
- Purpose and operation of service fusing
- Use of independent earth for testing

Evidence Guide

EVIDENCE GUIDE

9) This provides essential advice for assessment of the unit of competency and must be read in conjunction with the Performance Criteria and the range statement of the unit of competency and the Training Package Assessment Guidelines.

The Evidence Guide forms an integral part of this Competency Standard Unit and shall be used in conjunction with all component parts of this unit and, performed in accordance with the Assessment Guidelines of this Training Package.

Overview of Assessment	**9.1)**
	Longitudinal competency development approaches to assessment, such as Profiling, require data to be reliably gathered in a form that can be consistently interpreted over time. This approach is best utilised in Apprenticeship programs and reduces assessment intervention. It is the Industry's preferred model for apprenticeships. However, where summative (or final) assessment is used it is to include the application of the competency in the normal work environment or, at a minimum, the application of the competency in a realistically simulated work environment. It is

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recognised that, in some circumstances, assessment in part or full can occur outside the workplace. However, it must be in accord with Industry and, Regulatory policy in this regard.

Methods chosen for a particular assessment will be influenced by various factors. These include the extent of the assessment, the most effective locations for the assessment activities to take place, access to physical resources, additional safety measures that may be required and the critical nature of the competencies being assessed.

The critical safety nature of working with electricity, electrical equipment, gas or any other hazardous substance/material carries risk in deeming a person competent. Hence, sources of evidence need to be 'rich' in nature so as to minimise error in judgment.

Activities associated with normal every day work have a bearing on the decision as to how much and how detailed the data gathered will contribute to its 'richness'. Some skills are more critical to safety and operational requirements while the same skills may be more or less frequently practiced. These points are raised for the assessors to consider when choosing an assessment method and developing assessment instruments. Sample assessment instruments are included for Assessors in the Assessment Guidelines of this Training Package.

Critical aspects of evidence required to demonstrate competency in this unit

9.2)

Before the critical aspects of evidence are considered all prerequisites shall be met.

Evidence for competence in this unit shall be considered holistically. Each element and associated Performance Criteria shall be demonstrated on at least two occasions in accordance with the "Assessment Guidelines – UET12". Evidence shall also comprise:

- A representative body of Performance Criteria demonstrated within the timeframes typically expected of the discipline, work function and industrial environment. In particular this shall incorporate evidence that shows a candidate is able to:
  - Implement Occupational Health and Safety workplace procedures and practices including the use of risk control measures as specified in the Performance Criteria and

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range; and

- Apply sustainable energy principles and practices as specified in the Performance Criteria and range; and
- Demonstrate an understanding of the essential knowledge and associated skills as described in this unit to such an extent that the learner's performance outcome is reported in accordance with the preferred approach; namely a percentile graded result, where required by the regulated environment; and
- Demonstrate an appropriate level of employability skills; and

- Conduct work observing the relevant Anti Discrimination legislation, regulations, policies and workplace procedures; and
  - Demonstrated performance across a representative range of contexts from the prescribed items below:

Range of tools/equipment/materials/procedures/workplaces/other variables		
Group No	**The minimum number of items on which skill is to be demonstrated**	**Item List**
A	At least two of the following:	Overhead service line (three phase)* Overhead service line (single phase) Overhead service line (two phase) (* must do)
B	At least one of the following:	Service fuse Circuit breakers (pole) Service link
C	All of the following:	Polarity test * Phase rotation test Continuity test Voltage test (* must do)

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D	At least one of the following:	Aluminium LV mains Copper LV mains LV ABC mains
E	At least one occasion	Dealing with an unplanned event by drawing on essential knowledge and associated skills to provide appropriate solutions incorporated in the holistic assessment with the above listed items.

Context of and specific resources for assessment

9.3)

This unit should be assessed as it relates to normal work practice using procedures, information and resources typical of a workplace. This should include:

- OHS policy and work procedures and instructions.
- Suitable work environment, facilities, equipment and materials to undertake actual installation and maintenance of overhead LV services.

In addition to the resources listed above, in Context of and specific resources for assessment, evidence should show demonstrated competency working below ground, in limited spaces, with different structural/construction types and method and in a variety of environments.

Method of assessment

9.4)

This Competency Standard Unit shall be assessed by methods given in Volume 1, Part 3 “Assessment Guidelines”.

Note:

Competent performance with inherent safe working practices is expected in the Industry to which this Competency Standard Unit applies. This requires that the specified essential knowledge and

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associated skills are assessed in a structured environment which is primarily intended for learning/assessment and incorporates all necessary equipment and facilities for learners to develop and demonstrate the essential knowledge and associated skills described in this unit.

Concurrent assessment and relationship with other units

9.5)

There are no concurrent assessment recommendations for this unit.

Range Statement

RANGE STATEMENT

10) This relates to the unit of competency as a whole providing the range of contexts and conditions to which the Performance Criteria apply. It allows for different work environments and situations that will affect performance.

This Competency Standard Unit shall be demonstrated in relation to the installation and maintenance of overhead low voltage services as they relate to distribution circuits and associated equipment and includes the identification of faults.

Installation may include, the erection and connection of service lines, the fitting and connection of pole fuses or circuit breakers and the testing and commissioning of the service.

Maintenance may include the identification and diagnosis of faults, the removal, replacement or repair of service lines and associated hardware and the temporary installation of services and associated equipment and the testing and commissioning of the service.

Testing procedures may include continuity, polarity, phase rotation, insulation resistance and voltage.

Testing equipment may include, digital/analogue voltage testers, multimeters, phase rotation testers, load testers, insulation resistance and continuity testers.

Associated hardware may include pole fuse units, circuit breakers, contactors, mains connection boxes.

The following constants and variables included in the element/Performance Criteria in this unit are fully described in the Definitions Section 1 of this volume and form an integral part of the Range Statement of this unit:

- Appropriate and relevant persons (see Personnel)

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RANGE STATEMENT

- Appropriate authorities
- Appropriate work platform
- Assessing risk
- Assessment
- Authorisation
- Confined space
- Diagnostic, testing and restoration
- Documenting detail work events, record keeping and or storage of information
- Drawings and specifications
- Emergency
- Environmental and sustainable energy procedures
- Environmental legislation
- Environmental management documentation
- Established procedures
- Fall prevention
- Hazards
- Identifying hazards
- Inspect
- Legislation
- MSDS
- Notification.
- OHS practices
- OHS issues
- Permits and/or permits to work
- Personnel
- Quality assurance systems
- Requirements
- Testing procedures
- Work clearance systems

Unit Sector(s)

Not applicable.

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Competency Field

Competency Field **11)**

Industry Specific Cross-Discipline Units

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UETTDRIS67A Solve problems in energy supply network equipment

Modification History

Not applicable.

Unit Descriptor

Unit Descriptor **1) Scope:**

1.1) Descriptor

This unit covers determining correct operation of energy supply network electrical equipment and providing solutions as they apply to energy supply network electrical equipment.. It encompasses working safely, reading circuit and reticulation diagrams, applying logical problem solving processes from measurements and completing the necessary documentation.

Application of the Unit

Application of the Unit **2)**

This unit is intended as an additional competency to relevant competencies previously acquired and is therefore not applicable to those entering work.

Licensing/Regulatory Information

License to practice **3)**

The skills and knowledge described in this unit require a license to practice in the work place subject to regulations for undertaking of electrical work. Practice in workplace and during training is also subject to regulations directly related to occupational health and safe and contracts of training such as new apprenticeships.

Note:

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License to practice **3)**

1. Compliance with permits may be required in various jurisdictions and typically relates to the operation of plant, machinery and equipment such as elevating work platforms, powder operated fixing tools, power operated tools, vehicles, road signage and traffic control and lifting equipment. Permits may also be required for some work environments such as confined spaces, working aloft, near live electrical apparatus and site rehabilitation.

2. Compliance may be required in various jurisdictions relating to currency in First Aid, confined space, lifting and risk safety measures.

Pre-Requisites

Prerequisite Unit(s) **4)**

Competencies **4.1)**

Granting of competency in this unit shall be made only after competency in the following unit(s) has/have been confirmed.

Where pre-requisite pathways have been identified. All competencies in the Common Unit Group must be have been completed plus all the competencies in one (1) of the identified Pathway Unit Group(s):

Common Unit Group

Unit Code	Unit Title
UEENEEE101A	Apply Occupational Health and Safety regulations, codes and practices in the workplace
UEENEEE102A	Fabricate, assemble and dismantle utilities industry components
UEENEEE104A	Solve problems in d.c. Circuits
UEENEEE105A	Fix and secure electrotechnology equipment
UEENEEE107A	Use drawings, diagrams, schedules, standards, codes and specifications

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Prerequisite Unit(s) **4)**

UEENEEG101A	Solve problems in electromagnetic devices and related circuits
UEENEEG102A	Solve problems in low voltage a.c. Circuits
UEENEEG006A	Solve problems in single and three phase low voltage machines
UEENEEG106A	Terminate cables, cords and accessories for low voltage circuits

Literacy and numeracy skills **4.2)**

Participants are best equipped to achieve competency in this unit if they have reading, writing and numeracy skills indicated by the following scales. Description of each scale is given in Volume 2, Part 3 'Literacy and Numeracy'

Reading	4	Writing	4	Numeracy	4

Employability Skills Information

Employability Skills **5)**

The required outcomes described in this unit of competency contain applicable facets of Employability Skills. The Employability Skills Summary of the qualification in which this unit of competency is packaged will assist in identifying Employability Skill requirements.

Elements and Performance Criteria Pre-Content

6) Elements describe the essential outcomes of a competency standard unit	Performance Criteria describe the required performance needed to demonstrate achievement of the element. Assessment of performance is to be consistent with the Evidence Guide.

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Elements and Performance Criteria

ELEMENT	PERFORMANCE CRITERIA
1 Prepare to solve problems in energy supply network equipment.	1.1 OHS procedures for a given work area are identified, obtained and understood.
	1.2 OHS risk control measures and procedures in preparation for the work are followed.
	1.3 The likely extent of work to be undertaken is envisaged from reports and/or discussions with appropriate person(s).
	1.4 Advice is sought from the work supervisor to ensure the work is coordinated effectively with others.
	1.5 Sources of materials that may be required for the work are established in accordance with established procedures.
	1.6 Tools, equipment and testing devices needed to take measurements are obtained in accordance with established procedures and checked for correct operation and safety.
2 Solve problems in energy supply network equipment.	2.1 OHS risk control measures and procedures for carrying out the work are followed.
	2.2 The need to test or measure live is determined in strict accordance with OHS requirements and when necessary conducted within established safety procedures.
	2.3 Circuits/machines/plant are checked as being isolated where necessary in strict accordance OHS requirements and procedures.
	2.4 Safety hazards resulting from the reports and risk control measures devised and implemented in consultation with appropriate personnel.
	2.5 Problem solving is approached methodically drawing on knowledge of energy network equipment using measured and calculated values

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ELEMENT	PERFORMANCE CRITERIA	
		of circuit/apparatus parameters.
	2.6	Circuit/apparatus components are dismantled where necessary and parts stored to protect them against loss or damage
	2.7	Circuits/components are rechecked and their operational status is confirmed.
	2.8	Materials/replacement parts required to solve problems are sourced and obtained in accordance with established procedures.
	2.9	Effectiveness of the repair is tested in accordance with established procedures.
	2.10	Apparatus is reassembled, finally tested and prepared for return to service.
	2.11	Unexpected situations are dealt with safely and with the approval of an authorised person.
	2.12	Problem solving activities are carried out without damage to apparatus, circuits, the surrounding environment or services and using sustainable energy practices.
3 Completion and report for problem solving in energy supply network equipment	3.1	OHS work completion risk control measures and procedures are followed.
	3.2	Reusable, faulty or worn components are tagged and dispatched for repair to maintain adequate spares.
	3.3	Maintenance work activities are documented in accordance with established procedures.
		Note. Examples of documentation are component, test results, authorisations, permits, and parts/component dispatch and stores records.

Required Skills and Knowledge

REQUIRED SKILLS AND KNOWLEDGE

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REQUIRED SKILLS AND KNOWLEDGE

8) This describes the essential skills and knowledge and their level, required for this unit.

Evidence shall show that knowledge has been acquired of safe working practices and solving problems in energy supply network equipment in energy supply network equipment.

All knowledge and skills detailed in this unit should be contextualised to current industry practices and technologies.

KS01-TIS67A Electricity supply and reticulation

Evidence shall show an understanding of electricity supply and reticulation systems to an extent indicated by the following aspects:

T1 Generation encompassing:

- primary energy sources
- power stations
- power station output
- acts and legislation relating to generation
- renewable energy sources and techniques

T2 Transmission encompassing:

- system requirements
- principal components of a power system
- voltage levels
- grid systems
- acts/legislation relating to transmission
- future trends

T3 Distribution encompassing:

- high voltage distribution systems
- medium/low voltage distribution systems
- radial feeders
- parallel feeders
- ring main feeders
- acts/legislation relating to distribution

T4 Substations encompassing:

- purpose
- location
- layout

T5 Overhead and underground systems encompassing:

- relative merits
- applications

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REQUIRED SKILLS AND KNOWLEDGE

- planning
- installation

T6 Power distribution system electrical characteristics encompassing:

- transmission and distribution systems
- inductance, capacitance and resistance

T7 Voltage problems in a power distribution system encompassing:

- low voltage
- unbalanced voltages
- voltage rises

T8 Voltage regulation encompassing:

- autotransformers with OLTC
- transformers with OLTC
- static capacitors
- load control

T9 Control of OLTC encompassing:

- regulation relays
- control circuits
- line drop compensation

T10 Power distribution system faults encompassing:

- type/classification of fault
- typical causes/effects of faults
- three-phase symmetrical fault levels
- fault level limitation

T11 Voltage surges in a power distribution system encompassing:

- lightning surges
- switching surges
- typical surge levels
- surge impedance, typical values
- significance of the system surge impedance.

T12 Metering and metered quantities encompassing:

- purpose
- energy
- maximum demand
- accuracy classes for metering systems

T13 Energy and demand meters encompassing:

- construction

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REQUIRED SKILLS AND KNOWLEDGE

- operation
- adjustments
- testing

T14 Metering circuits encompassing:

- direct metering
- instrument transformer metering

T15 Electronic metering systems and recording meters encompassing:

- types
- applications
- connections

T16 Load control encompassing:

- purpose
- methods

Evidence Guide

EVIDENCE GUIDE

9) This provides essential advice for assessment of the unit. It must be read in conjunction with the performance criteria and the range statement of the unit and the Training Package Assessment Guidelines.

The Evidence Guide forms an integral part of this unit. It must be used in conjunction with all parts of this unit and performed in accordance with the Assessment Guidelines of this Training Package.

Overview of Assessment **9.1)**

Longitudinal competency development approaches to assessment, such as Profiling, require data to be reliably gathered in a form that can be consistently interpreted over time. This approach is best utilised in Apprenticeship programs and reduces assessment intervention. It is the Industry's preferred model for apprenticeships. However, where summative (or final) assessment is used it is to include the application of the competency in the normal work environment or, at a minimum, the application of the competency in a realistically simulated work environment. It is recognised that, in some circumstances, assessment in part or full can occur outside the workplace. However, it must be in

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accordance with industry and regulatory policy.

Methods chosen for a particular assessment will be influenced by various factors. These include the extent of the assessment, the most effective locations for the assessment activities to take place, access to physical resources, additional safety measures that may be required and the critical nature of the competencies being assessed.

The critical safety nature of working with electricity, electrical equipment, gas or any other hazardous substance/material carries risk in deeming a person competent. Sources of evidence need to be 'rich' in nature to minimise error in judgment.

Activities associated with normal every day work have a bearing on the decision as to how much and how detailed the data gathered will contribute to its 'richness'. Some skills are more critical to safety and operational requirements while the same skills may be more or less frequently practised. These points are raised for the assessors to consider when choosing an assessment method and developing assessment instruments. Sample assessment instruments are included for Assessors in the Assessment Guidelines of this Training Package.

Critical aspects of evidence required to demonstrate competency in this unit

9.2)

Before the critical aspects of evidence are considered all prerequisites shall be met.

Evidence for competence in this unit shall be considered holistically. Each element and associated performance criteria shall be demonstrated on at least two occasions in accordance with the 'Assessment Guidelines – UET12'. Evidence shall also comprise:

- A representative body of work performance demonstrated within the timeframes typically expected of the discipline, work function and industrial environment. In particular this shall incorporate evidence that shows a candidate is able to:
  - Implement Occupational Health and Safety workplace procedures and practices including the use of risk control measures as specified in the performance criteria and range statement
  - Apply sustainable energy principles and practices as

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specified in the performance criteria and range statement
    - Demonstrate an understanding of the essential knowledge and associated skills as described in this unit. It may be required by some jurisdictions that RTOs provide a percentile graded result for the purpose of regulatory or licensing requirements.
    - Demonstrate an appropriate level of skills enabling employment
    - Conduct work observing the relevant Anti Discrimination legislation, regulations, polices and workplace procedures
- Demonstrated consistent performance across a representative range of contexts from the prescribed items below:
    - Solving problems in energy supply network equipment as described as described in 8) and including:

A Determining the operating parameters of existing energy supply equipment.

B Envisaging the likely extent of work from reports and discussion with appropriate person(s).

C Using methodical problem solving techniques.

D Solving problems efficiently.

E Altering an existing energy supply equipment to comply with specified operating parameters.

F Developing energy supply equipment to comply with a specified function and operating parameters.

G Determining conditions causing an existing energy supply equipment to be unsafe.

H Completing documentation correctly.

I Dealing with unplanned events by drawing on essential knowledge and skills to provide appropriate solutions incorporated in the holistic assessment with the above listed items.

Note:
Successful completion of relevant vendor training may be used to contribute to evidence on which competency is deemed. In these cases the alignment of outcomes of vendor training with performance criteria and critical aspects of evidence shall be clearly identified.

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Context of and specific resources for assessment

9.3)

This unit should be assessed as it relates to normal work practice using procedures, information and resources typical of a workplace. This should include:

- OHS policy and work procedures and instructions.
- Suitable work environment, facilities, equipment and materials to undertake actual work as prescribed by this unit.

These should be part of the formal learning/assessment environment.

Note:

Where simulation is considered a suitable strategy for assessment, conditions must be authentic and as far as possible reproduce and replicate the workplace and be consistent with the approved industry simulation policy.

The resources used for assessment should reflect current industry practices in relation to solving problems in energy supply network equipment.

Method of assessment

9.4)

This unit shall be assessed by methods given in Volume 1, Part 3 'Assessment Guidelines'.

Note:

Competent performance with inherent safe working practices is expected in the industry to which this unit applies. This requires assessment in a structured environment which is primarily intended for learning/assessment and incorporates all necessary equipment and facilities for learners to develop and demonstrate the essential knowledge and skills described in this unit.

Concurrent assessment and relationship with other units

9.5)

For optimisation of training and assessment effort, competency

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development in this unit may be arranged concurrently with unit:

UEENEEG006A	Solve problems in single and three phase low voltage machines

Range Statement

RANGE STATEMENT

10) This relates to the unit as a whole providing the range of contexts and conditions to which the performance criteria apply. It allows for different work environments and situations that will affect performance.

This unit shall be demonstrated by solving problems in energy supply network equipment in:

At least one of energy supply network systems:

- distribution overhead system;
- distribution underground system;
- transmission overhead system;
- transmission underground system.

and

At least three of the following distribution/transmission equipment:

- voltage regulation equipment
- on load tap changers
- energy metering
- demand meters
- load control
- current transformers
- potential transformers

Generic terms used throughout this Vocational Standard shall be regarded as part of the Range Statement in which competency is demonstrated. The definition of these and other terms that apply are given in Volume 2, Part 2.1.

Unit Sector(s)

Not applicable.

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Competency Field

Competency Field **11)**

Industry Specific Cross-Discipline Units

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UETTDRRT21A Install traction overhead wiring systems

Modification History

Not applicable.

Unit Descriptor

Unit Descriptor **1) Scope:**

1.1) Descriptor

This Competency Standard Unit covers the installation of overhead traction wiring systems to ensure proper installation, in particular the correct registration of the contact wire with respect to the current collectors. It includes the undertaking of safe working practices on or about the running line/track and the preparation needed for stringing and profiling including the isolation of systems and circuits for safe working according to work plans. It may also encompass the correct positioning of road signs, barriers and or warning devices, and the procedure of issuing/accepting electrical permits. It also includes the visual and other necessary checks to confirm that equipment and associated hardware have been correctly installed according to design and are in a safe condition to undertake pre-commissioning tests prior to, putting into service, and updating of, installation data such as as-built drawings and relevant quality assurance documentation.

Application of the Unit

Application of the Unit **2)**

This Competency Standard Unit is intended to augment formally acquired competencies. It is suitable for employment-based programs under an approved contract of training.

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Licensing/Regulatory Information

License to practice **3)**

The skills and knowledge described in this unit may require a licence/registration to practice in the work place subject to regulations for undertaking of electrical work. Practice in workplace and during training is also subject to regulations directly related to Occupational Health and Safety, electricity/telecommunications/gas/water industry safety and compliance, industrial relations, environmental protection, anti discrimination and training. Commonwealth, State/Territory or Local Government legislation and regulations may exist that limits the age of operating certain equipment.

Pre-Requisites

Prerequisite Unit(s) **4)**

Competencies **4.1)**

Granting of competency in this unit shall be made only after competency in the following unit(s) has/have been confirmed.

Where pre-requisite pathways have been identified. All competencies in the Common Unit Group must be have been completed.

Common Unit Group

UEENEEE101A	Apply Occupational Health and Safety regulations, codes and practices in the workplace
UEENEEE102A	Fabricate, assemble and dismantle utilities industry components
UEENEEE104A	Solve problems in d.c. Circuits
UEENEEE105A	Fix and secure electrotechnology equipment
UEENEEE107A	Use drawings, diagrams, schedules, standards, codes and specifications

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Prerequisite Unit(s) **4)**

UEENEEG101A	Solve problems in electromagnetic devices and related circuits
UEENEEG102A	Solve problems in low voltage a.c. Circuits
UETTDREL11A	Apply sustainable energy and environmental procedures
UETTDREL12A	Operate plant and equipment near live electrical conductors and apparatus
UETTDREL16A	Working safely near live electrical apparatus
UETTDRIS52A	Install and maintain poles, structures and associated hardware
UETTDRIS54A	Install and maintain poles, structures, overhead conductors and cables

Literacy and numeracy skills **4.2)**

Participants are best equipped to achieve this unit if they have reading, writing and numeracy skills indicated by the following scales. Description of each scale is given in Volume 2, Part 3 “Literacy and Numeracy”.

Reading	3	Writing	3	Numeracy	3

Employability Skills Information

Employability Skills **5)**

The required outcomes described in this unit of competency contain applicable facets of Employability Skills. The Employability Skills Summary of the qualification in which this unit of competency is packaged will assist in identifying Employability Skill requirements.

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Elements and Performance Criteria Pre-Content

6) Elements describe the essential outcomes of a competency standard unit	Performance Criteria describe the required performance needed to demonstrate achievement of the element. Assessment of performance is to be consistent with the Evidence Guide.

Elements and Performance Criteria

ELEMENT	PERFORMANCE CRITERIA	
1 Prepare to install overhead traction wiring systems	1.1	Works schedule(s), including drawings, plans, requirements, established procedures, and material lists, are received, analysed and confirmed, if necessary, by site inspection.
	1.2	Relevant requirements and established procedures for the work are communicated to all personnel and identified for all work sites.
	1.3	OHS policies and procedures related to requirements and established procedures for the installation of overhead traction wiring systems are obtained and confirmed for the purposes of the work to be performed and communicated.
	1.4	Work is prioritised and sequenced following consultation with others for completion within acceptable timeframes and in accordance with established procedures.
	1.5	Hazards are identified, OHS risks assessed and control measures are prioritised, implemented and monitored including emergency exits kept clear according to established procedures.
	1.6	Relevant work permits are obtained to access and perform work according to requirements and/or established procedures.
	1.7	Resources including personnel, equipment, tools and personal protective equipment required for the job are obtained and confirmed in working order.
	1.8	Relevant personnel at worksite are confirmed current in CPR, First Aid, and other rescue

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ELEMENT	PERFORMANCE CRITERIA	
		procedures and related work procedures according to requirements.
	1.9	Liaison and communication issues with other authorised personnel, authorities, clients and land owners are resolved to carry out work where necessary.
	1.10	Site is prepared according to the work schedule and to minimise risk and damage to property, commerce, and individuals in accordance with established procedures.
	1.11	Personnel participating in the work, including plant operators and contractors, are fully briefed and respective responsibilities confirmed where applicable in accordance with established procedures.
	1.12	Rail/Road signs, barriers and warning devices are positioned in accordance with requirements
	1.13	Environmental constraints applicable to work are identified and control measures applied.
2 Carry out the installation of overhead traction wiring systems	2.1	OHS and sustainable energy principles and practices to reduce the incidents of accidents and minimise waste are monitored and followed in accordance with requirements and/or established procedures.
	2.2	Lifting, climbing, working aloft, and use of power tools/equipment, techniques and practices are safely followed and, currency according to requirements confirmed.
	2.3	Systems and circuits are isolated as required, proved safe to work on in accordance with the requirements/permits and established procedures.
	2.4	Essential knowledge and associated skills are applied in the safe installation of overhead traction wiring systems to ensure completion in an agreed timeframe and, to quality standards with a minimum of waste according to requirements.

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ELEMENT		PERFORMANCE CRITERIA	
		2.5	Overhead traction wiring systems, including cables, fittings, traction conductors and associated equipment are installed according to design and work schedule requirements and established procedures.
		2.6	Profiling completed according to established procedures.
		2.7	Hazard warnings and safety signs are recognised and hazards and assessed OHS risks are reported to the immediate authorised persons for directions according to established procedures.
		2.8	Unplanned events in the installation of overhead traction wiring systems are undertaken within the scope of established procedures.
		2.9	Known solutions to a variety of problems are applied using acquired essential knowledge and associated skills.
		2.10	Ongoing checks of quality of the work are undertaken in accordance with instructions and established procedures.
3	Complete the installation of overhead traction wiring systems	3.1	Work undertaken is checked against design drawings and works schedule for conformance with requirements and anomalies reported in accordance with established procedures.
		3.2	Accidents and/or injuries are reported in accordance with requirements/established procedures, where applicable.
		3.3	Work site is rehabilitated, cleaned up and made safe in accordance with established procedures.
		3.4	Tools, equipment and any surplus resources and materials are, where appropriate, cleaned, checked and returned to storage in accordance with established procedures.
		3.5	Relevant work permit(s) are signed off and, the overhead traction wiring system is returned to service in accordance with requirements.

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ELEMENT	PERFORMANCE CRITERIA
	3.6 Works completion records, reports, as installed /modified drawing and/or documentation and information are finalised and processed and appropriate personnel notified.

Required Skills and Knowledge

REQUIRED SKILLS AND KNOWLEDGE

8) Essential Knowledge and Associated Skills (EKAS): This describes the essential skills and knowledge and their level, required for this unit.

Evidence shall show that knowledge of installing overhead traction wiring systems has been acquired.

All knowledge and skills detailed in this unit should be contextualised to current industry practices and technologies.

KS02-TRT21A Electrical overhead traction wiring systems

Evidence shall show an understanding of electrical traction systems to an extent indicated by the following aspects:

T1 Electrical wiring system components - earth wires, feeder wire, return conductor, insulators, catenary wire, contact/trolley wire, droppers, tensioning equipment, current collectors, tram support networks, tram fittings, bridge/tunnel fittings

T2 Electrical traction circuits encompassing:

- Types
- Applications

T3 Relationship of the components, apparatus and the conductors to the operation of the traction system

T4 Effective current collection and wire interface

T5 Effective registration in the traction power system

T6 Profiling overhead traction wire methods encompassing:

- Factors that impact on current collectors
- Methods to achieving smooth current collector transitions and interfaces
- T7 Dynamic and static forces encompassing:
- Types that effect traction systems
- Effects on effective registration
- Techniques to minimise the adverse effects

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REQUIRED SKILLS AND KNOWLEDGE

KS03-TRT21A Electrical traction principles

Evidence shall show an understanding of electrical traction principles to an extent indicated by the following aspects:

T1 Standards, codes, legislation, supply authority regulations and or enterprise requirements applicable to the electrical traction

T2 Electrical traction voltage and current circuit paths encompassing:

- Transmission distribution voltages
- Traction supply system and voltages
- Return and stay current paths, including electrolysis

T3 Relationship of sectioning, section insulator and overlaps/air gaps in a traction power system

T4 Traction power system components encompassing:

- Function of transformer/rectifiers
- Configuration and purpose of traction overhead wiring systems
- Function of isolators/switches
- Function of the circuit breaker

T5 Reliability and security of traction supply

Evidence Guide

EVIDENCE GUIDE

9) This provides essential advice for assessment of the competency standard unit and must be read in conjunction with the Performance Criteria and the range statement of the competency standard unit and the Training Package Assessment Guidelines.

The Evidence Guide forms an integral part of this Competency Standard Unit and shall be used in conjunction with all component parts of this unit and, performed in accordance with the Assessment Guidelines of this Training Package.

Overview of Assessment	**9.1)**
	Longitudinal competency development approaches to assessment, such as Profiling, require data to be reliably gathered in a form that can be consistently interpreted over time. This approach is best utilised in Apprenticeship programs and reduces assessment intervention. It is the Industry's preferred model for

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apprenticeships. However, where summative (or final) assessment is used it is to include the application of the competency in the normal work environment or, at a minimum, the application of the competency in a realistically simulated work environment. It is recognised that, in some circumstances, assessment in part or full can occur outside the workplace. However, it must be in accord with Industry and, Regulatory policy in this regard.

Methods chosen for a particular assessment will be influenced by various factors. These include the extent of the assessment, the most effective locations for the assessment activities to take place, access to physical resources, additional safety measures that may be required and the critical nature of the competencies being assessed.

The critical safety nature of working with electricity, electrical equipment, gas or any other hazardous substance/material carries risk in deeming a person competent. Hence, sources of evidence need to be 'rich' in nature so as to minimise error in judgment.

Activities associated with normal every day work have a bearing on the decision as to how much and how detailed the data gathered will contribute to its 'richness'. Some skills are more critical to safety and operational requirements while the same skills may be more or less frequently practiced. These points are raised for the assessors to consider when choosing an assessment method and developing assessment instruments. Sample assessment instruments are included for Assessors in the Assessment Guidelines of this Training Package.

Critical aspects of evidence required to demonstrate competency in this unit

9.2)

Before the critical aspects of evidence are considered all prerequisites shall be met.

Evidence for competence in this unit shall be considered holistically. Each element and associated Performance Criteria shall be demonstrated on at least two occasions in accordance with the "Assessment Guidelines – UET12". Evidence shall also comprise:

- A representative body of Performance Criteria demonstrated within the timeframes typically expected of the discipline, work function and industrial environment. In particular this

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shall incorporate evidence that shows a candidate is able to:

- Implement Occupational Health and Safety workplace procedures and practices including the use of risk control measures as specified in the Performance Criteria and range; and
- Apply sustainable energy principles and practices as specified in the Performance Criteria and range; and
- Demonstrate an understanding of the essential knowledge and associated skills as described in this unit to such an extent that the learner's performance outcome is reported in accordance with the preferred approach; namely a percentile graded result, where required by the regulated environment; and
- Demonstrate an appropriate level of employability skills; and

- Conduct work observing the relevant Anti Discrimination legislation, regulations, policies and workplace procedures; and
  - Demonstrated performance across a representative range of contexts from the prescribed items below:

Range of tools/equipment/materials/procedures/workplaces/other variables		
Group No	**The minimum number of items on which skill is to be demonstrated**	**Item List**
A	At least four of the following:	Support structure, Span, Section insulator, Neutral section, Midpoint anchor, Support equipment, Tension regulators, Stay/guy wire, Tramway support network
B	At least two of the following:	Catenary, Dropper,

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		Contact/trolley*, Feeder, Earth conductor, Drape/potential jumper (*must do)
C	At least one of the following:	Elevating work platform, Ladder, Mobile platform
D	At least two of the following:	Tensioning equipment*, Specialised tools, Ropes, Geometry profiling equipment. (*must do)
E	At least one occasion	Dealing with an unplanned event by drawing on essential knowledge and associated skills to provide appropriate solutions incorporated in the holistic assessment with the above listed items.

Context of and specific resources for assessment

9.3)

This unit should be assessed as it relates to normal work practice using procedures, information and resources typical of a workplace. This should include:

- OHS policy and work procedures and instructions.
- Suitable work environment, facilities, equipment and materials to undertake actual installation of overhead traction wiring systems.

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In addition to the resources listed above, in context of and specific resources for assessment, evidence should show demonstrated competency working below ground, in limited spaces, with different structural/construction types and method and in a variety of environments.

Method of assessment

9.4)

This Competency Standard Unit shall be assessed by methods given in Volume 1, Part 3 “Assessment Guidelines”.

Note:

Competent performance with inherent safe working practices is expected in the Transmission, Distribution and Rail Traction Industry. This requires that the specified essential knowledge and associated skills are assessed in a structured environment which is primarily intended for learning/assessment and incorporates all necessary equipment and facilities for learners to develop and demonstrate the essential knowledge and associated skills described in this unit.

Concurrent assessment and relationship with other units

9.5)

For optimisation of training and assessment effort, competence in this unit may be assessed concurrently with the following units:

UETTDRRT27A	Install overhead traction components and equipment

Range Statement

RANGE STATEMENT

10) This relates to the competency standard unit as a whole providing the range of contexts and conditions to which the Performance Criteria apply. It allows for different work environments and situations that will affect performance.

This Unit shall be demonstrated in relation to the installation of overhead traction wiring systems as it relates to the correct registration of the contact wire with respect

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RANGE STATEMENT

to the current collectors

Types of conductor may include HD, CAD, tin bearing and magnesium copper, aluminium, steel, aluminium conductor steel reinforced (ACSR), insulated screened and unscreened cable and pilot and control cables.

Materials and equipment may include porcelain, glass, ceramic, fibre glass and composite insulators, steel, brass, stainless steel, neoprene, copper, cast and galvanized fittings, drums, pulleys, hooks, yoke plate, line grips, tensioning devices, ropes, slings, hydraulic/manual crimping and cutting tools, specialized tools and dynamometers; Conductors and support wires include droppers wire, catenary wire, contact/trolley wire, earth wire, feeder wire, drape/potential jumper wire, stay wire, cross-span, networks and head span wire.

Associated equipment to conductors may include registration arms, midpoint anchors, section insulators, neutral sections, supports, cantilevers, portals, drop verticals, surge diverters and tensioning devices.

Plant may include ladders, elevating work platform, winches and capstans, specialist tensioning stringing equipment, cable trailers and drum stands, rail and road rail mounted overhead wiring vehicles.

Installing tension regulators encompasses fitting, positioning and securing weight chains and pulley systems.

Permits may include access permits, permits to work and or other relevant permits and documents by recognised bodies.

Profiling encompasses sag, tension, encumbrances, offsets, cants and registration which involves horizontal and vertical calibration of the contact wire or trolley wire to a design height and stagger in reference to the running rail.

Current collectors may include pantographs and tram trolley poles.

The following constants and variables included in the element/Performance Criteria in this unit are fully described in the Definitions Section 1 of this volume and form an integral part of the Range Statement of this unit:

- Appropriate and relevant persons (see Personnel)
- Appropriate authorities
- Appropriate work platform
- Assessing risk
- Assessment
- Authorisation
- Confined space
- Diagnostic, testing and restoration
- Documenting detail of work events, record keeping and or storage of information
- Drawings and specifications
- Emergency

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RANGE STATEMENT

- Environmental and sustainable energy procedures
- Environmental legislation
- Environmental management documentation
- Established procedures
- Fall prevention
- Hazards
- Identifying hazards
- Inspect
- Legislation
- MSDS
- Notification
- OHS practices
- OHS issues
- Permits and/or permits to work
- Personnel
- Quality assurance systems
- Requirements
- Testing procedures
- Work clearance systems

Unit Sector(s)

Not applicable.

Competency Field

Competency Field **11)**

Rail Traction Units

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UETTDRRT22A Maintain traction overhead wiring systems

Modification History

Not applicable.

Unit Descriptor

Unit Descriptor **1) Scope:**

1.1) Descriptor

This Competency Standard Unit covers the maintenance and repair of overhead traction wiring systems to ensure their serviceability, in particular the correct registration of the contact wire with respect to the current collectors. It includes the undertaking of safe working practises on or about the running line/track, the preparation needed for stringing and profiling including the isolation of systems and circuits for safe working according to work plans, the diagnosis of faults and the modification and re-adjustment to appropriate standards. It may also encompass the correct positioning of road signs, barriers and or warning devices and the procedure of issuing/accepting electrical permits, the re-commissioning tests as required to ensure the integrity of the traction system prior to returning to service and, the updating of system data and/or maintenance records.

Application of the Unit

Application of the Unit **2)**

This Competency Standard Unit is intended to augment formally acquired competencies. It is suitable for employment-based programs under an approved contract of training.

Licensing/Regulatory Information

License to practice **3)**

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License to practice **3)**

The skills and knowledge described in this unit may require a licence/registration to practice in the work place subject to regulations for undertaking of electrical work. Practice in workplace and during training is also subject to regulations directly related to Occupational Health and Safety, electricity/telecommunications/gas/water industry safety and compliance, industrial relations, environmental protection, anti discrimination and training. Commonwealth, State/Territory or Local Government legislation and regulations may exist that limits the age of operating certain equipment.

Pre-Requisites

Prerequisite Unit(s) **4)**

Competencies **4.1)**

Granting of competency in this unit shall be made only after competency in the following unit(s) has/have been confirmed.

Where pre-requisite pathways have been identified. All competencies in the Common Unit Group must be have been completed.

Common Unit Group

Unit Code	Unit Title
UEENEEE101A	Apply Occupational Health and Safety regulations, codes and practices in the workplace
UEENEEE102A	Fabricate, assemble and dismantle utilities industry components
UEENEEE104A	Solve problems in d.c. Circuits
UEENEEE105A	Fix and secure electrotechnology equipment
UEENEEE107A	Use drawings, diagrams, schedules, standards, codes and specifications

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Prerequisite Unit(s) **4)**

UEENEEG101A	Solve problems in electromagnetic devices and related circuits
UEENEEG102A	Solve problems in low voltage a.c. Circuits
UETTDREL11A	Apply sustainable energy and environmental procedures
UETTDREL12A	Operate plant and equipment near live electrical conductors and apparatus
UETTDREL16A	Working safely near live electrical apparatus
UETTDRIS52A	Install and maintain poles, structures and associated hardware
UETTDRIS54A	Install and maintain poles, structures, overhead conductors and cables
UETTDRRT21A	Install traction overhead wiring systems

Literacy and numeracy skills **4.2)**

Participants are best equipped to achieve this unit if they have reading, writing and numeracy skills indicated by the following scales. Description of each scale is given in Volume 2, Part 3 “Literacy and Numeracy”.

Reading	3	Writing	3	Numeracy	3

Employability Skills Information

Employability Skills **5)**

The required outcomes described in this unit of competency contain applicable facets of Employability Skills. The Employability Skills Summary of the qualification in which this unit of competency is packaged

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Employability Skills **5)**

will assist in identifying Employability Skill requirements.

Elements and Performance Criteria Pre-Content

6) Elements describe the essential outcomes of a competency standard unit

Performance Criteria describe the required performance needed to demonstrate achievement of the element. Assessment of performance is to be consistent with the Evidence Guide.

Elements and Performance Criteria

ELEMENT	PERFORMANCE CRITERIA
1 Prepare to maintain overhead traction wiring systems	1.1 Works schedule(s), including drawings, plans, requirements, established procedures, and material lists, are received, analysed and confirmed, if necessary, by site inspection.
	1.2 Relevant requirements and established procedures for the work are communicated to all personnel and identified for all work sites.
	1.3 OHS policies and procedures related to requirements and established procedures for the maintenance of overhead traction wiring systems are obtained and confirmed for the purposes of the work to be performed and communicated.
	1.4 Work is prioritised and sequenced following consultation with others for completion within acceptable timeframes and in accordance with established procedures.
	1.5 Hazards are identified; OHS risks assessed and control measures are prioritised, implemented and monitored including emergency exits kept clear according to established procedures.
	1.6 Relevant work permits are obtained to access and perform work according to requirements and/or established procedures.

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ELEMENT	PERFORMANCE CRITERIA	
	1.7	Resources including personnel, equipment, tools and personal protective equipment required for the job are obtained and confirmed in working order.
	1.8	Relevant personnel at worksite are confirmed current in CPR, First Aid, and other rescue procedures according to requirements.
	1.9	Liaison and communication issues with other authorised personnel, authorities, clients and land owners are resolved to carry out work where necessary.
	1.10	Site is prepared according to the work schedule and to minimise risk and damage to property, commerce, and individuals in accordance with established procedures.
	1.11	Personnel participating in the work, including plant operators and contractors, are fully briefed and respective responsibilities confirmed where applicable in accordance with established procedures.
	1.12	Rail/road signs, barriers and warning devices are positioned in accordance with requirements.
	1.13	Environmental constraints applicable to work are identified and control measures applied.
2 Carry out maintenance on overhead traction wiring systems	2.1	OHS and sustainable energy principles and practices to reduce the incidents of accidents and minimise waste are monitored and followed in accordance with requirements and/or established procedures.
	2.2	Lifting, climbing, working aloft, and use of power tools/equipment, techniques and practices are safely followed and, currency according to requirements confirmed.
	2.3	Systems and circuits are isolated as required, proved safe to work on in accordance with the requirements/permits and established procedures.
	2.4	Essential knowledge and associated skills are

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ELEMENT	PERFORMANCE CRITERIA	
		applied for the safe maintenance of overhead traction wiring systems to ensure completion in an agreed timeframe and, to quality standards with a minimum of waste according to requirements.
	2.5	Maintenance, including repair and/or replacement of overhead traction wiring systems, including the modification and re-adjustment of overhead traction conductors is carried out, in accordance with the work schedule and requirements/established procedures.
	2.6	Hazard warnings and safety signs are recognised and hazards and assessed OHS risks are reported to the immediate authorised persons for directions according to established procedures.
	2.7	Unplanned events in the maintenance on overhead traction wiring systems are undertaken within the scope of established procedures.
	2.8	Known solutions to a variety of problems are applied using acquired essential knowledge and associated skills.
	2.9	Ongoing checks of quality of the work are undertaken in accordance with instructions and established procedures.
	2.10	Recommissioning checks and tests are undertaken to ensure the integrity of the system prior to returning to service.
3 Complete the maintenance on overhead traction wiring systems	3.1	Work undertaken is checked against works schedule for conformance with requirements and anomalies reported in accordance with established procedures
	3.2	Accidents and/or injuries are reported in accordance with requirements/established procedures, where applicable.
	3.3	Work site is rehabilitated, cleaned up and made safe in accordance with established procedures.
	3.4	Tools, equipment and any surplus resources and materials are, where appropriate, cleaned,

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ELEMENT	PERFORMANCE CRITERIA
	checked and returned to storage in accordance with established procedures.
	3.5 Relevant work permit(s) are signed off and, the overhead traction wiring system is returned to service in accordance with requirements.
	3.6 Works completion records, reports, as installed /modified drawing and/or documentation and information are finalised and processed and appropriate personnel notified.

Required Skills and Knowledge

REQUIRED SKILLS AND KNOWLEDGE

8) Essential Knowledge and Associated Skills (EKAS): This describes the essential skills and knowledge and their level, required for this unit.

Evidence shall show that knowledge of maintaining overhead traction wiring systems has been acquired.

All knowledge and skills detailed in this unit should be contextualised to current industry practices and technologies.

KS01-TRT22A Maintain overhead traction wiring systems

Evidence shall show an understanding of the maintenance of overhead wiring systems indicated by the following aspects:

T1 Electrical wiring system components

- (Note: Examples include catenary wire, contact/trolley wire, droppers, feeder wire, return conductor, insulators, surge arresters, cantilevers, tensioning equipment, tram support network, tram fittings, bridge/tunnel fittings, current collectors)

T2 Electrical traction circuits encompassing:

- Types
- Applications

T3 Relationship of the components, apparatus and conductors to the operation of the traction system

T4 Effective current collection and wire interface

T5 Effective registration in the traction power system

T6 Dynamic and static forces encompassing:

- Types that effect traction systems

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REQUIRED SKILLS AND KNOWLEDGE

- Effects on effective registration
- Techniques to minimise adverse effects

T7 Safe and effective use of repair and maintenance tools, equipment and machinery

T8 Maintenance of overhead traction wiring systems encompassing:

- Types of equipment and components
- Types and function of tools and equipment
- Maintenance/repair procedures
- Inspection and recording procedures

T9 Diagnose and correct simple faults in specific overhead wiring systems encompassing:

- Types and causes
- Determination of appropriate corrective actions
- Repair and replace procedures for overhead wiring systems

Evidence Guide

EVIDENCE GUIDE

9) This provides essential advice for assessment of the competency standard unit and must be read in conjunction with the Performance Criteria and the range statement of the competency standard unit and the Training Package Assessment Guidelines.

The Evidence Guide forms an integral part of this Competency Standard Unit and shall be used in conjunction with all component parts of this unit and, performed in accordance with the Assessment Guidelines of this Training Package.

Overview of Assessment **9.1)**

Longitudinal competency development approaches to assessment, such as Profiling, require data to be reliably gathered in a form that can be consistently interpreted over time. This approach is best utilised in Apprenticeship programs and reduces assessment intervention. It is the Industry's preferred model for apprenticeships. However, where summative (or final) assessment is used it is to include the application of the competency in the normal work environment or, at a minimum, the application of the competency in a realistically simulated work environment. It is recognised that, in some circumstances, assessment in part or full

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can occur outside the workplace. However, it must be in accord with Industry and, Regulatory policy in this regard.

Methods chosen for a particular assessment will be influenced by various factors. These include the extent of the assessment, the most effective locations for the assessment activities to take place, access to physical resources, additional safety measures that may be required and the critical nature of the competencies being assessed.

The critical safety nature of working with electricity, electrical equipment, gas or any other hazardous substance/material carries risk in deeming a person competent. Hence, sources of evidence need to be 'rich' in nature so as to minimise error in judgment.

Activities associated with normal every day work have a bearing on the decision as to how much and how detailed the data gathered will contribute to its 'richness'. Some skills are more critical to safety and operational requirements while the same skills may be more or less frequently practiced. These points are raised for the assessors to consider when choosing an assessment method and developing assessment instruments. Sample assessment instruments are included for Assessors in the Assessment Guidelines of this Training Package.

Critical aspects of evidence required to demonstrate competency in this unit

9.2)

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Before the critical aspects of evidence are considered all prerequisites shall be met.

Evidence for competence in this unit shall be considered holistically. Each element and associated Performance Criteria shall be demonstrated on at least two occasions in accordance with the "Assessment Guidelines – UET12". Evidence shall also comprise:

- A representative body of Performance Criteria demonstrated within the timeframes typically expected of the discipline, work function and industrial environment. In particular this shall incorporate evidence that shows a candidate is able to:
  - Implement Occupational Health and Safety workplace procedures and practices including the use of risk control measures as specified in the Performance Criteria and range; and
  - Apply sustainable energy principles and practices as specified in the Performance Criteria and range; and
  - Demonstrate an understanding of the essential knowledge and associated skills as described in this unit to such an extent that the learner's performance outcome is reported in accordance with the preferred approach; namely a percentile graded result, where required by the regulated environment; and
  - Demonstrate an appropriate level of employability skills; and
- Conduct work observing the relevant Anti Discrimination legislation, regulations, policies and workplace procedures; and
  - Demonstrated performance across a representative range of contexts from the prescribed items below:

Range of tools/equipment/materials/procedures/workplaces/other variables		
Group No	**The minimum number of items on which skill is to be demonstrated**	**Item List**
A	At least four of the following:	Support structure Span Section insulator Neutral section

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		Midpoint anchor Support equipment Tension regulators Stay/guy wire Tramway support network
B	At least two of the following:	Catenary Dropper Contact/trolley* Feeder Earth conductor Drape/potential jumper (* must do)
C	At least one of the following:	Elevating work platform Ladder Mobile platform
D	At least two of the following:	Tensioning equipment* Specialised tools Ropes Geometry profiling equipment (* must do)
E	At least one occasion	Dealing with an unplanned event by drawing on essential knowledge and associated skills to provide appropriate solutions incorporated in the holistic assessment with the above listed items.

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Context of and specific resources for assessment

9.3)

This unit should be assessed as it relates to normal work practice using procedures, information and resources typical of a workplace. This should include:

- OHS policy and work procedures and instructions.
- Suitable work environment, facilities, equipment and materials to undertake actual maintenance of overhead traction wiring systems.

In addition to the resources listed above, in context of and specific resources for assessment, evidence should show demonstrated competency working below ground, in limited spaces, with different structural/construction types and method and in a variety of environments.

Method of assessment

9.4)

This Competency Standard Unit shall be assessed by methods given in Volume 1, Part 3 “Assessment Guidelines”.

Note:

Competent performance with inherent safe working practices is expected in the Transmission, Distribution and Rail Traction Industry. This requires that the specified essential knowledge and associated skills are assessed in a structured environment which is primarily intended for learning/assessment and incorporates all necessary equipment and facilities for learners to develop and demonstrate the essential knowledge and associated skills described in this unit.

Concurrent assessment and relationship with other units

9.5)

For optimisation of training and assessment effort, competence in this unit may be assessed concurrently with the following units:

UETTDRRT2 Maintain overhead traction components and

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8A	equipment
UETTDRRT29A	Operate rail road traction height access equipment.

Range Statement

RANGE STATEMENT

10) This relates to the competency standard unit as a whole providing the range of contexts and conditions to which the Performance Criteria apply. It allows for different work environments and situations that will affect performance.

This Competency Standard Unit shall be demonstrated in relation to the maintenance of overhead traction wiring systems as it relates to the correct registration of the contact wire with respect to the current collectors

Maintenance may include the removal, repair and replacement of cables, conductors and associated hardware.

Types of conductor may include HD, CAD, tin bearing and magnesium copper, aluminium, steel, aluminium conductor steel reinforced (ACSR), insulated screened and unscreened cable and pilot and control cables.

Materials and equipment may include porcelain, glass, ceramic, fibre glass and composite insulators, steel, brass, stainless steel, neoprene, copper, cast and galvanized fittings, drums, pulleys, hooks, yoke plate, line grips, tensioning devices, ropes, slings, hydraulic/manual crimping and cutting tools, specialized tools and dynamometers.

Conductors and support wires include droppers wire, catenary wire, contact/trolley wire, earth wire, feeder wire, drape/potential jumper wire, stay wire, cross-span, networks and head span wire.

Associated equipment to conductors may include registration arms, midpoint anchors, section insulators, neutral sections, supports, cantilevers, portals, drop verticals, surge diverters and tensioning devices.

Plant may include ladders, elevating work platform, winches and capstans, specialist tensioning stringing equipment, cable trailers and drum stands, rail and road rail mounted overhead wiring vehicles.

Installing tension regulators encompasses fitting, positioning and securing weight chains and pulley systems.

Permits may include access permits, permits to work and or other relevant permits and documents by recognised bodies.

Profiling encompasses sag, tension, encumbrances, offsets, cants and registration which involves horizontal and vertical calibration of the contact wire or trolley wire to a design height and stagger in reference to the running rail.

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RANGE STATEMENT

Current collectors may include pantographs and tram trolley poles.

The following constants and variables included in the element/Performance Criteria in this unit are fully described in the Definitions Section 1 of this volume and form an integral part of the Range Statement of this unit:

- Appropriate and relevant persons (see Personnel)
- Appropriate authorities
- Appropriate work platform
- Assessing risk
- Assessment
- Authorisation
- Confined space
- Diagnostic, testing and restoration
- Documenting detail of work events, record keeping and or storage of information
- Drawings and specifications
- Emergency
- Environmental and sustainable energy procedures
- Environmental legislation.
- Environmental management documentation.
- Established procedures
- Fall prevention
- Hazards
- Identifying hazards
- Inspect
- Legislation
- MSDS
- Notification
- OHS practices
- OHS issues
- Permits and/or permits to work
- Personnel
- Quality assurance systems
- Requirements
- Testing procedures
- Work clearance systems

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Unit Sector(s)

Not applicable.

Competency Field

Competency Field **11)**

Rail Traction Units

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UETTDRRT23A Install rail traction bonds

Modification History

Not applicable.

Unit Descriptor

Unit Descriptor **1) Scope:**

1.1) Descriptor

This Competency Standard Unit covers the installation of the temporary and permanent traction bonds and bonding cables. It includes the undertaking of safe working practices on or about the running line/track. It may also encompass the isolation of systems and circuits for safe working according to work plans and the correct positioning of road signs, barriers and or warning devices and the procedure of issuing/accepting electrical permits and includes the necessary checks to confirm that bonds, bonding cables and associated hardware have been correctly installed according to design and are in a safe condition to test prior to putting into service. It also includes the undertaking of pre-commissioning tests and the updating of installation data and relevant quality assurance documentation.

Application of the Unit

Application of the Unit **2)**

This Competency Standard Unit is intended to augment formally acquired competencies. It is suitable for employment-based programs under an approved contract of training.

Licensing/Regulatory Information

License to practice **3)**

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License to practice **3)**

The skills and knowledge described in this unit may require a licence/registration to practice in the work place subject to regulations for undertaking of electrical work. Practice in workplace and during training is also subject to regulations directly related to Occupational Health and Safety, electricity/telecommunications/gas/water industry safety and compliance, industrial relations, environmental protection, anti discrimination and training. Commonwealth, State/Territory or Local Government legislation and regulations may exist that limits the age of operating certain equipment.

Pre-Requisites

Prerequisite Unit(s) **4)**

Competencies **4.1)**

Granting of competency in this unit shall be made only after competency in the following unit(s) has/have been confirmed.

Where pre-requisite pathways have been identified. All competencies in the Common Unit Group must be have been completed.

Common Unit Group

Unit Code	Unit Title
UEENEEE101A	Apply Occupational Health and Safety regulations, codes and practices in the workplace
UEENEEE102A	Fabricate, assemble and dismantle utilities industry components
UEENEEE104A	Solve problems in d.c. Circuits
UEENEEE105A	Fix and secure electrotechnology equipment
UEENEEE107A	Use drawings, diagrams, schedules, standards, codes and specifications

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Prerequisite Unit(s) **4)**

UEENEEG101A	Solve problems in electromagnetic devices and related circuits
UEENEEG102A	Solve problems in low voltage a.c. Circuits
UETTDREL11A	Apply sustainable energy and environmental procedures
UETTDREL12A	Operate plant and equipment near live electrical conductors and apparatus
UETTDREL16A	Working safely near live electrical apparatus
UETTDRIS52A	Install and maintain poles, structures and associated hardware
UETTDRIS54A	Install and maintain poles, structures, overhead conductors and cables

Literacy and numeracy skills **4.2)**

Participants are best equipped to achieve this unit if they have reading, writing and numeracy skills indicated by the following scales. Description of each scale is given in Volume 2, Part 3 “Literacy and Numeracy”.

Reading 3 Writing 3 Numeracy 3

Employability Skills Information

Employability Skills **5)**

The required outcomes described in this unit of competency contain applicable facets of Employability Skills. The Employability Skills Summary of the qualification in which this unit of competency is packaged will assist in identifying Employability Skill requirements.

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Elements and Performance Criteria Pre-Content

6) Elements describe the essential outcomes of a competency standard unit	Performance Criteria describe the required performance needed to demonstrate achievement of the element. Assessment of performance is to be consistent with the Evidence Guide.

Elements and Performance Criteria

ELEMENT	PERFORMANCE CRITERIA	
1 Prepare to install traction bonds	1.1	Works schedule(s), including drawings, plans, requirements, established procedures, and material lists, are received, analysed and confirmed, if necessary, by site inspection.
	1.2	Relevant requirements and established procedures for the work are communicated to all personnel and identified for all work sites.
	1.3	OHS policies and procedures related to requirements and established procedures for the installation of traction bonds are obtained and confirmed for the purposes of the work to be performed and communicated.
	1.4	Work is prioritised and sequenced following consultation with others for completion within acceptable timeframes and in accordance with established procedures.
	1.5	Hazards are identified; OHS risks assessed and control measures are prioritised, implemented and monitored including emergency exits kept clear according to established procedures.
	1.6	Relevant work permits are obtained to access and perform work according to requirements and/or established procedures.
	1.7	Resources including personnel, equipment, tools and personal protective equipment required for the job are obtained and confirmed in working order.
	1.8	Relevant personnel at worksite are confirmed current in CPR, First Aid, and other rescue

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ELEMENT		PERFORMANCE CRITERIA	
			procedures according to requirements.
		1.9	Liaison and communication issues with other authorised personnel, authorities, clients and land owners are resolved to carry out work where necessary.
		1.10	Site is prepared according to the work schedule and to minimise risk and damage to property, commerce, and individuals in accordance with established procedures.
		1.11	Personnel participating in the work, including plant operators and contractors, are fully briefed and respective responsibilities confirmed where applicable in accordance with established procedures.
		1.12	Rail/road signs, barriers and warning devices are positioned in accordance with requirements.
		1.13	Environmental constraints applicable to work.
2	Carry out installation of traction bonds	2.1	OHS and sustainable energy principles and practices to reduce the incidents of accidents and minimise waste are monitored and followed in accordance with requirements and/or established procedures.
		2.2	Lifting, climbing, working aloft, and use of power tools/equipment, techniques and practices are safely followed and, currency according to requirements confirmed.
		2.3	Systems and circuits are isolated as required, proved safe to work on in accordance with the requirements/permits and established procedures.
		2.4	Essential knowledge and associated skills are applied in the safe installation of traction bonds and bonding cables to ensure completion in an agreed timeframe and, to quality standards with a minimum of waste according to requirements.
		2.5	Cable and surrounds, including rail and other surfaces, are prepared to enable joint and terminations to be carried out according to

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ELEMENT	PERFORMANCE CRITERIA	
		established procedures.
	2.6	Traction bonds are carried out according to requirements and established procedures.
	2.7	Hazard warnings and safety signs are recognised and hazards and assessed OHS risks are reported to the immediate authorised persons for directions according to established procedures.
	2.8	Unplanned events during the installation of traction bonds are undertaken within the scope of established procedures.
	2.9	Known solutions to a variety of problems are applied using acquired essential knowledge and associated skills.
	2.10	Ongoing checks of quality of the work are undertaken in accordance with instructions and established procedures.
3 Complete the installation of traction bonds	3.1	Work undertaken is checked and tested against design drawings and works schedule for conformance with requirements and anomalies reported in accordance with established procedures.
	3.2	Work site is rehabilitated, cleaned up and made safe in accordance with established procedures.
	3.3	Tools, equipment and any surplus resources and materials are, where appropriate, cleaned, checked and returned to storage in accordance with established procedures.
	3.4	Relevant work permit(s) are signed off and, the system that has undergone the installation of a traction bond(s) is returned to service in accordance with requirements.
	3.5	Works completion records, reports, as installed /modified drawing and/or documentation and information are finalised and processed and appropriate personnel notified.

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Required Skills and Knowledge

REQUIRED SKILLS AND KNOWLEDGE

8) Essential Knowledge and Associated Skills (EKAS): This describes the essential skills and knowledge and their level, required for this unit.

Evidence shall show that knowledge of installing traction bonds has been acquired.

All knowledge and skills detailed in this unit should be contextualised to current industry practices and technologies.

KS01-TRT23A Traction Bonding

Evidence shall show an understanding of the installation of permanent traction bonds to an extent indicated by the following aspects:

T1 Traction bond and cables encompassing:

- Permanent bonding methods
- Applications for permanent bonding
- Components of permanent bonds
- Interface between traction and signalling circuits

T2 Safe working procedures/practices when carrying out permanent bonding encompassing:

- Personnel protective equipment (PPE)
- Electrical and visual testing on PPE

T3 Installation of temporary traction bonds and cables encompassing:

- Types and purpose of tools and equipment
- Installation and removal methods
- Testing for electrical integrity of bonds and cables

T4 Installation of permanent traction bonds and cables encompassing:

- Types and purposes of tools and equipment
- Installation and removal methods
- Testing for electrical integrity of bond, cables and equipment

Evidence Guide

EVIDENCE GUIDE

9) This provides essential advice for assessment of the competency standard unit and must be read in conjunction with the Performance Criteria and the range statement of the competency standard unit and the Training Package Assessment Guidelines.

The Evidence Guide forms an integral part of this Competency Standard Unit and shall be used in conjunction with all component parts of this unit and, performed in

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EVIDENCE GUIDE

accordance with the Assessment Guidelines of this Training Package.

Overview of Assessment **9.1)**

Longitudinal competency development approaches to assessment, such as Profiling, require data to be reliably gathered in a form that can be consistently interpreted over time. This approach is best utilised in Apprenticeship programs and reduces assessment intervention. It is the Industry's preferred model for apprenticeships. However, where summative (or final) assessment is used it is to include the application of the competency in the normal work environment or, at a minimum, the application of the competency in a realistically simulated work environment. It is recognised that, in some circumstances, assessment in part or full can occur outside the workplace. However, it must be in accord with Industry and, Regulatory policy in this regard.

Methods chosen for a particular assessment will be influenced by various factors. These include the extent of the assessment, the most effective locations for the assessment activities to take place, access to physical resources, additional safety measures that may be required and the critical nature of the competencies being assessed.

The critical safety nature of working with electricity, electrical equipment, gas or any other hazardous substance/material carries risk in deeming a person competent. Hence, sources of evidence need to be 'rich' in nature so as to minimise error in judgment.

Activities associated with normal every day work have a bearing on the decision as to how much and how detailed the data gathered will contribute to its 'richness'. Some skills are more critical to safety and operational requirements while the same skills may be more or less frequently practiced. These points are raised for the assessors to consider when choosing an assessment method and developing assessment instruments. Sample assessment instruments are included for Assessors in the Assessment Guidelines of this Training Package.

Critical aspects of evidence required to demonstrate competency in **9.2)**

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this unit

Before the critical aspects of evidence are considered all prerequisites shall be met.

Evidence for competence in this unit shall be considered holistically. Each element and associated Performance Criteria shall be demonstrated on at least two occasions in accordance with the "Assessment Guidelines – UET12". Evidence shall also comprise:

- A representative body of Performance Criteria demonstrated within the timeframes typically expected of the discipline, work function and industrial environment. In particular this shall incorporate evidence that shows a candidate is able to:
  - Implement Occupational Health and Safety workplace procedures and practices including the use of risk control measures as specified in the Performance Criteria and range; and
  - Apply sustainable energy principles and practices as specified in the Performance Criteria and range; and
  - Demonstrate an understanding of the essential knowledge and associated skills as described in this unit to such an extent that the learner's performance outcome is reported in accordance with the preferred approach; namely a percentile graded result, where required by the regulated environment; and
  - Demonstrate an appropriate level of employability skills; and
- Conduct work observing the relevant Anti Discrimination legislation, regulations, policies and workplace procedures; and
  - Demonstrated performance across a representative range of contexts from the prescribed items below:

Range of tools/equipment/materials/procedures/workplaces/other variables		
Group No	**The minimum number of items on which skill is to be demonstrated**	**Item List**
A	At least two of the following:	Covered or bare aluminium bonds Copper bonds

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		Steel bonds Steel rail
B	At least three of the following:	Bonding specific tools Crimping devices Thermal moulds Rail drill Bonding fittings Explosive power tools Portable hand tools
C	At least one occasion	Dealing with an unplanned event by drawing on essential knowledge and associated skills to provide appropriate solutions incorporated in the holistic assessment with the above listed items.

Context of and specific resources for assessment **9.3)**

This unit should be assessed as it relates to normal work practice using procedures, information and resources typical of a workplace. This should include:

- OHS policy and work procedures and instructions.
- Suitable work environment, facilities, equipment and materials to undertake actual installation of traction bonds.

In addition to the resources listed above, in context of and specific resources for assessment, evidence should show demonstrated competency working below ground, in limited spaces, with different structural/construction types and method and in a variety of environments.

Method of **9.4)**

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assessment

This Competency Standard Unit shall be assessed by methods given in Volume 1, Part 3 “Assessment Guidelines”.

Note:

Competent performance with inherent safe working practices is expected in the Transmission, Distribution and Rail Traction Industry. This requires that the specified essential knowledge and associated skills are assessed in a structured environment which is primarily intended for learning/assessment and incorporates all necessary equipment and facilities for learners to develop and demonstrate the essential knowledge and associated skills described in this unit.

Concurrent assessment and relationship with other units

9.5)

For optimisation of training and assessment effort, competence in this unit may be assessed concurrently with the following units:

UETTDRRT21A	Install traction overhead wiring systems
UETTDRRT27A	Install overhead traction components and equipment

Range Statement

RANGE STATEMENT

10) This relates to the competency standard unit as a whole providing the range of contexts and conditions to which the Performance Criteria apply. It allows for different work environments and situations that will affect performance.

This Competency Standard Unit shall be demonstrated in relation to the installation of the temporary and permanent traction bonds and bonding cables according to work plans.

Installation includes but is not limited to fitting, setting up and putting in place structures, conductors, bonding cables, equipment, spark gaps and connecting terminals and conducting tests for operational soundness.

Earthing and bonding systems may be permanent or temporary.

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RANGE STATEMENT

Types of conductors may include steel, steel rail, copper, aluminium and steel, bare and sheathed cables, single core, stranded and flexible.

Cables may be surfaced mounted, buried and enclosed.

Permanent jointing and terminating materials include polymeric tape materials, polymeric heat shrink and covering materials, exothermic welds, crimped and bolted connections.

Temporary terminating components include screwed and clipped earth/rail/conductor clamps.

The following constants and variables included in the element/Performance Criteria in this unit are fully described in the Definitions Section 1 of this volume and form an integral part of the Range Statement of this unit:

- Appropriate and relevant persons (see Personnel)
- Appropriate authorities
- Appropriate work platform
- Assessing risk
- Assessment
- Authorisation
- Confined space
- Diagnostic, testing and restoration
- Documenting detail of work events, record keeping and or storage of information
- Drawings and specifications
- Emergency
- Environmental and sustainable energy procedures
- Environmental legislation
- Environmental management documentation
- Established procedures
- Fall prevention
- Hazards
- Identifying hazards
- Inspect
- Legislation
- MSDS
- Notification
- OHS practices
- OHS issues
- Permits and/or permits to work
- Personnel

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RANGE STATEMENT

- Quality assurance systems
- Requirements
- Testing procedures
- Work clearance systems

Unit Sector(s)

Not applicable.

Competency Field

Competency Field **11)**

Rail Traction Units

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UETTDRRT27A Install overhead traction components and equipment

Modification History

Not applicable.

Unit Descriptor

Unit Descriptor **1) Scope:**

1.1) Descriptor

This Competency Standard Unit covers the installation of the overhead traction electrical equipment and components as well as associated hardware including ancillary equipment. It includes the undertaking of safe working practices on or about the running line/track. It also encompasses the isolation of systems and circuits for safe working according to work plans and the correct positioning of road signs, barriers and or warning devices and the procedure of issuing/accepting electrical permits. It also includes the visual inspection and necessary checks to confirm that equipment, components and associated hardware have been correctly installed according to design and are in a safe condition to test prior to putting to service, the undertaking of pre-commissioning tests as required to ensure the integrity of the traction system prior to putting back into service and the updating of installation data and relevant quality assurance documentation.

Application of the Unit

Application of the Unit **2)**

This Competency Standard Unit is intended to augment formally acquired competencies. It is suitable for employment-based programs under an approved contract of training.

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Licensing/Regulatory Information

License to practice **3)**

The skills and knowledge described in this unit may require a licence/registration to practice in the work place subject to regulations for undertaking of electrical work. Practice in workplace and during training is also subject to regulations directly related to Occupational Health and Safety, electricity/telecommunications/gas/water industry safety and compliance, industrial relations, environmental protection, anti discrimination and training. Commonwealth, State/Territory or Local Government legislation and regulations may exist that limits the age of operating certain equipment.

Pre-Requisites

Prerequisite Unit(s) **4)**

Competencies **4.1)**

Granting of competency in this unit shall be made only after competency in the following unit(s) has/have been confirmed.

Where pre-requisite pathways have been identified. All competencies in the Common Unit Group must be have been completed.

Common Unit Group

Unit Code	Unit Title
UEENEEE101A	Apply Occupational Health and Safety regulations, codes and practices in the workplace
UEENEEE102A	Fabricate, assemble and dismantle utilities industry components
UEENEEE104A	Solve problems in d.c. Circuits
UEENEEE105A	Fix and secure electrotechnology equipment
UEENEEE107A	Use drawings, diagrams, schedules,

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Prerequisite Unit(s) **4)**

	standards, codes and specifications
UEENEEG101A	Solve problems in electromagnetic devices and related circuits
UEENEEG102A	Solve problems in low voltage a.c. Circuits
UETTDREL11A	Apply sustainable energy and environmental procedures
UETTDREL12A	Operate plant and equipment near live electrical conductors and apparatus
UETTDREL16A	Working safely near live electrical apparatus
UETTDRIS52A	Install and maintain poles, structures and associated hardware
UETTDRIS54A	Install and maintain poles, structures, overhead conductors and cables

Literacy and numeracy skills **4.2)**

Participants are best equipped to achieve this unit if they have reading, writing and numeracy skills indicated by the following scales. Description of each scale is given in Volume 2, Part 3 “Literacy and Numeracy”.

Reading 3 Writing 3 Numeracy 3

Employability Skills Information

Employability Skills **5)**

The required outcomes described in this unit of competency contain applicable facets of Employability Skills. The Employability Skills Summary of the qualification in which this unit of competency is packaged will assist in identifying Employability Skill requirements.

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Elements and Performance Criteria Pre-Content

6) Elements describe the essential outcomes of a competency standard unit	Performance Criteria describe the required performance needed to demonstrate achievement of the element. Assessment of performance is to be consistent with the Evidence Guide.

Elements and Performance Criteria

ELEMENT	PERFORMANCE CRITERIA	
1 Prepare for the installation of overhead traction equipment/components	1.1	Works schedule(s), including drawings, plans, requirements, established procedures, and material lists, are received, analysed and confirmed, if necessary, by site inspection.
	1.2	Relevant requirements and established procedures for the work are communicated to all personnel and identified for all work sites.
	1.3	OHS policies and procedures related to requirements and established procedures for the installation of overhead traction equipment/components are obtained and confirmed for the purposes of the work to be performed and communicated.
	1.4	Work is prioritised and sequenced following consultation with others for completion within acceptable timeframes and in accordance with established procedures.
	1.5	Hazards are identified; OHS risks assessed and control measures are prioritised, implemented and monitored including emergency exits kept clear according to established procedures.
	1.6	Relevant work permits are obtained to access and perform work according to requirements and/or established procedures.
	1.7	Resources including personnel, equipment, tools and personal protective equipment required for the job are obtained and confirmed in working

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ELEMENT		PERFORMANCE CRITERIA	
			order.
		1.8	Relevant personnel at worksite are confirmed current in CPR, First Aid, and other rescue procedures according to requirements.
		1.9	Liaison and communication issues with other authorised personnel, authorities, clients and land owners are resolved to carry out work where necessary.
		1.10	Site is prepared according to the work schedule and to minimise risk and damage to property, commerce, and individuals in accordance with established procedures
		1.11	Rail/road signs, barriers and warning devices are positioned in accordance with requirements.
		1.12	Environmental constraints applicable to work are identified and control measures applied.
2	Carry out the installation of overhead traction equipment/components	2.1	OHS and sustainable energy principles and practices to reduce the incidents of accidents and minimise waste are monitored and followed in accordance with requirements and/or established procedures.
		2.2	Lifting, climbing, working aloft, and use of power tools/equipment, techniques and practices are safely followed and, currency according to requirements confirmed.
		2.3	Systems and circuits are isolated as required, proved safe to work on in accordance with the requirements/permits and established procedures.
		2.4	Essential knowledge and associated skills are applied in the safe installation of overhead traction equipment/components to ensure completion in an agreed timeframe and, to quality standards with a minimum of waste according to requirements.
		2.5	Electrical components/equipment and associated hardware are positioned, secured and terminated/connected in accordance with

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ELEMENT	PERFORMANCE CRITERIA	
		requirements and established procedures.
	2.6	Hazard warnings and safety signs are recognised and hazards and assessed OHS risks are reported to the immediate authorised persons for directions according to established procedures.
	2.7	Unplanned events during the installation of overhead traction equipment/components are undertaken within the scope of established procedures.
	2.8	Known solutions to a variety of problems are applied using acquired essential knowledge and associated skills.
	2.9	Ongoing checks of quality of the work are undertaken in accordance with instructions and established procedures.
3 Complete the installation of overhead traction equipment/components	3.1	Work undertaken is checked against design drawings and works schedule for conformance with requirements and anomalies reported in accordance with established procedures.
	3.2	Work site is rehabilitated, cleaned up and made safe in accordance with established procedures.
	3.3	Tools, equipment and any surplus resources and materials are, where appropriate, cleaned, checked and returned to storage in accordance with established procedures.
	3.4	Relevant work permit(s) are signed off and, overhead traction equipment/components are commissioned in accordance with requirements.
	3.5	Works completion records, reports, as installed /modified drawing and/or documentation and information are finalised and processed and appropriate personnel notified.

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Required Skills and Knowledge

REQUIRED SKILLS AND KNOWLEDGE

8) Essential Knowledge and Associated Skills (EKAS): This describes the essential skills and knowledge and their level, required for this unit.

Evidence shall show that knowledge of installing overhead traction equipment and components has been acquired.

All knowledge and skills detailed in this unit should be contextualised to current industry practices and technologies.

KS01-TRT27A Overhead traction equipment and components

Evidence shall show an understanding of the installation of overhead traction equipment and components indicated by the following aspects:

T1 Overhead traction equipment encompassing:

- Types
- Purpose
- (Note: Examples include switches/isolators, fuse switches, links, section insulators, and fuses)

T2 Types of overhead components encompassing:

- Types
- Purpose
- (Note: Examples include cantilever hardware, droppers, bay components, portal hardware, head span hardware, section insulators, neutral sections, registration fittings, steady span, tension regulators and cross spans)

T3 Types of conductors used for overheads wiring such as hard-drawn, CAD, and tin-bearing copper, aluminium, steel, and other alloyed conductors

T4 Types of traction wire support structures that may consist of portals, cantilevers, drop pieces, head spans, cross spans and pull-offs

T5 Ancillary equipment

- Types
- Purpose
- (Note: Examples include surge arresters, booster and auxiliary transformers)

T6 Methods for installing conductors that may consist the use of:

- Preformed fittings
- Compression fittings
- Wedged fittings
- Bolted splices
- Lugs
- Bolted clamps

T7 Methods for installing components such as:

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REQUIRED SKILLS AND KNOWLEDGE

- Feeders
- Droppers
- Dissimilar conductors
- Jumpers
- Surge arresters

T8 Use of plant and equipment for installation work, such as:

- Elevating work platforms
- Ladders
- Works trains
- Rail-mounted overhead wiring equipment/vehicles
- Road/rail height access machinery/vehicles
- Voltage detectors
- Micrometer/gauges
- Tension wrenches
- Dynamometers
- Other specialised tools

Evidence Guide

EVIDENCE GUIDE

9) This provides essential advice for assessment of the competency standard unit and must be read in conjunction with the Performance Criteria and the range statement of the competency standard unit and the Training Package Assessment Guidelines.

The Evidence Guide forms an integral part of this Competency Standard Unit and shall be used in conjunction with all component parts of this unit and, performed in accordance with the Assessment Guidelines of this Training Package.

Overview of Assessment **9.1)**

Longitudinal competency development approaches to assessment, such as Profiling, require data to be reliably gathered in a form that can be consistently interpreted over time. This approach is best utilised in Apprenticeship programs and reduces assessment intervention. It is the Industry's preferred model for apprenticeships. However, where summative (or final) assessment is used it is to include the application of the competency in the normal work environment or, at a minimum, the application of the

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competency in a realistically simulated work environment. It is recognised that, in some circumstances, assessment in part or full can occur outside the workplace. However, it must be in accord with Industry and, Regulatory policy in this regard.

Methods chosen for a particular assessment will be influenced by various factors. These include the extent of the assessment, the most effective locations for the assessment activities to take place, access to physical resources, additional safety measures that may be required and the critical nature of the competencies being assessed.

The critical safety nature of working with electricity, electrical equipment, gas or any other hazardous substance/material carries risk in deeming a person competent. Hence, sources of evidence need to be 'rich' in nature so as to minimise error in judgment.

Activities associated with normal every day work have a bearing on the decision as to how much and how detailed the data gathered will contribute to its 'richness'. Some skills are more critical to safety and operational requirements while the same skills may be more or less frequently practiced. These points are raised for the assessors to consider when choosing an assessment method and developing assessment instruments. Sample assessment instruments are included for Assessors in the Assessment Guidelines of this Training Package.

Critical aspects of evidence required to demonstrate competency in this unit

9.2)

Before the critical aspects of evidence are considered all prerequisites shall be met.

Evidence for competence in this unit shall be considered holistically. Each element and associated Performance Criteria shall be demonstrated on at least two occasions in accordance with the "Assessment Guidelines – UET12". Evidence shall also comprise:

- A representative body of Performance Criteria demonstrated within the timeframes typically expected of the discipline, work function and industrial environment. In particular this shall incorporate evidence that shows a candidate is able to:
    - Implement Occupational Health and Safety workplace procedures and practices including the use of risk control

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measures as specified in the Performance Criteria and range; and

- Apply sustainable energy principles and practices as specified in the Performance Criteria and range; and
- Demonstrate an understanding of the essential knowledge and associated skills as described in this unit to such an extent that the learner's performance outcome is reported in accordance with the preferred approach; namely a percentile graded result, where required by the regulated environment; and
- Demonstrate an appropriate level of employability skills; and

- Conduct work observing the relevant Anti Discrimination legislation, regulations, policies and workplace procedures; and
  - Demonstrated performance across a representative range of contexts from the prescribed items below:

Range of tools/equipment/materials/procedures/workplaces/other variables		
Group No	**The minimum number of items on which skill is to be demonstrated**	**Item List**
A	At least two of the following:	Fuse switches Dropout fuses Section insulators Switches/isolators Links Fuses Surge diverters Transformers
B	At least five of the following:	Cantilever hardware Head span Neutral sections Pull offs Registration fittings Steady span

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		Tension regulators Cross spans Tramway support network Pendulum
C	At least two of the following:	Preformed fittings Compression fittings Wedge fittings Bolted splices
D	At least three of the following:	Feeders Dissimilar conductors Lugs Bolted clamp Drapes/potential jumper Droppers
E	At least two of the following:	Voltage detectors Micrometer/gauge Tension wrench Dynamometer Specialised tools
F	At least one occasion	Dealing with an unplanned event by drawing on essential knowledge and associated skills to provide appropriate solutions incorporated in the holistic assessment with the above listed items.

Context of and specific resources for assessment **9.3)**

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This unit should be assessed as it relates to normal work practice using procedures, information and resources typical of a workplace. This should include:

- OHS policy and work procedures and instructions.
- Suitable work environment, facilities, equipment and materials to undertake actual installation of overhead traction equipment and components.

In addition to the resources listed above, in context of and specific resources for assessment, evidence should show demonstrated competency working below ground, in limited spaces, with different structural/construction types and method and in a variety of environments.

Method of assessment **9.4)**

This Competency Standard Unit shall be assessed by methods given in Volume 1, Part 3 “Assessment Guidelines”.

Note:

Competent performance with inherent safe working practices is expected in the Transmission, Distribution and Rail Traction Industry. This requires that the specified essential knowledge and associated skills are assessed in a structured environment which is primarily intended for learning/assessment and incorporates all necessary equipment and facilities for learners to develop and demonstrate the essential knowledge and associated skills described in this unit.

Concurrent assessment and relationship with other units **9.5)**

For optimisation of training and assessment effort, competence in this unit may be assessed concurrently with the following units:

UETTDRRT2 Install traction overhead wiring systems 1A

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Range Statement

RANGE STATEMENT

10) This relates to the competency standard unit as a whole providing the range of contexts and conditions to which the Performance Criteria apply. It allows for different work environments and situations that will affect performance.

This Competency Standard Unit shall be demonstrated in relation to the installation, visual inspection and pre-commissioning tests of the overhead traction electrical equipment and components as well as associated hardware including ancillary equipment.

Installation includes but is not limited to fitting, setting up and putting in place conductors, equipment, systems and conducting tests for operational soundness.

Types of traction wire support structures may consist of portals, pull-off, drop-pieces, head spans, cross spans and tramway support networks.

Types of traction components may include droppers, bay components, cantilever hardware, portal hardware, steady spans hardware, steady spans, insulators, pull-off, tension regulators, section insulators, neutral sections, tramway frogs, pendulums, crossing pans and ears/hangers, booster and auxiliary transformers, air break switches, in-span feeders, isolation switches knuckles (insulated and non-insulated), cross arms.

Traction system components may consist of metalwork, wires, hardware, fittings and insulators.

Types of conductor may include HD, CAD and tin bearing copper, aluminium, steel, aluminium conductor steel reinforced, copper cover steel.

Types of wiring arrangements include single wire/tram systems, simple and compound catenary systems.

Plant may include ladders, elevating work platforms, winches, specialist tension string equipment, cable trailers, work trains, rail mounted overhead wiring equipment/vehicles and road rail mounted overhead wiring equipment/vehicles.

Ancillary equipment may include, transformers, switches, and surge diverters.

The following constants and variables included in the element/Performance Criteria in this unit are fully described in the Definitions Section 1 of this volume and form an integral part of the Range Statement of this unit:

- Appropriate and relevant persons (see Personnel)
- Appropriate authorities
- Appropriate work platform
- Assessing risk
- Assessment
- Authorisation
- Confined space
- Diagnostic, testing and restoration
- Documenting detail of work events, record keeping and or storage of

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RANGE STATEMENT

information

- Drawings and specifications
- Emergency
- Environmental and sustainable energy procedures
- Environmental legislation
- Environmental management documentation
- Established procedures
- Fall prevention
- Hazards
- Identifying hazards
- Inspect
- Legislation
- MSDS
- Notification
- OHS practices
- OHS issues
- Permits and/or permits to work
- Personnel
- Quality assurance systems
- Requirements
- Testing procedures
- Work clearance systems

Unit Sector(s)

Not applicable.

Competency Field

Competency Field **11)**

Rail Traction Units

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UETTDRRT28A Maintain overhead traction components and equipment

Modification History

Not applicable.

Unit Descriptor

Unit Descriptor **1) Scope:**

1.1) Descriptor

This Competency Standard Unit covers the maintenance and repair of the overhead traction electrical equipment and components as well as associated hardware including ancillary equipment. It includes the repair or replacement of “like for like” electrical components/equipment and associated hardware and the undertaking of safe working practices on or about the running line/track. It also encompasses the isolation of systems and circuits for safe working according to work plans and the correct positioning of road signs, barriers and or warning devices and the procedure of issuing/accepting electrical permits. It also includes the visual inspection and necessary checks to confirm that equipment; components and associated hardware are in a safe condition to test and/or return to service, the re-commissioning tests of the electrical equipment, components and associated hardware and the updating of system data/maintenance records.

Application of the Unit

Application of the Unit **2)**

This Competency Standard Unit is intended to augment formally acquired competencies. It is suitable for employment-based programs under an approved contract of training.

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Licensing/Regulatory Information

License to practice **3)**

The skills and knowledge described in this unit may require a licence/registration to practice in the work place subject to regulations for undertaking of electrical work. Practice in workplace and during training is also subject to regulations directly related to Occupational Health and Safety, electricity/telecommunications/gas/water industry safety and compliance, industrial relations, environmental protection, anti discrimination and training. Commonwealth, State/Territory or Local Government legislation and regulations may exist that limits the age of operating certain equipment.

Pre-Requisites

Prerequisite Unit(s) **4)**

Competencies **4.1)**

Granting of competency in this unit shall be made only after competency in the following unit(s) has/have been confirmed.

Where pre-requisite pathways have been identified. All competencies in the Common Unit Group must be have been completed.

Common Unit Group

Unit Code	Unit Title
UEENEEE101A	Apply Occupational Health and Safety regulations, codes and practices in the workplace
UEENEEE102A	Fabricate, assemble and dismantle utilities industry components
UEENEEE104A	Solve problems in d.c. Circuits
UEENEEE105A	Fix and secure electrotechnology equipment
UEENEEE107A	Use drawings, diagrams, schedules,

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Prerequisite Unit(s) **4)**

	standards, codes and specifications
UEENEEG101A	Solve problems in electromagnetic devices and related circuits
UEENEEG102A	Solve problems in low voltage a.c. Circuits
UETTDREL11A	Apply sustainable energy and environmental procedures
UETTDREL12A	Operate plant and equipment near live electrical conductors and apparatus
UETTDREL16A	Working safely near live electrical apparatus
UETTDRIS52A	Install and maintain poles, structures and associated hardware
UETTDRIS54A	Install and maintain poles, structures, overhead conductors and cables
UETTDRRT27A	Install overhead traction components and equipment

Literacy and numeracy skills **4.2)**

Participants are best equipped to achieve this unit if they have reading, writing and numeracy skills indicated by the following scales. Description of each scale is given in Volume 2, Part 3 “Literacy and Numeracy”

Reading	3	Writing	3	Numeracy	3

Employability Skills Information

Employability Skills **5)**

The required outcomes described in this unit of competency contain applicable facets of Employability Skills. The Employability Skills Summary of the

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Employability Skills	**5)** qualification in which this unit of competency is packaged will assist in identifying Employability Skill requirements.

Elements and Performance Criteria Pre-Content

6) Elements describe the essential outcomes of a competency standard unit	Performance Criteria describe the required performance needed to demonstrate achievement of the element. Assessment of performance is to be consistent with the Evidence Guide.

Elements and Performance Criteria

ELEMENT	PERFORMANCE CRITERIA	
1 Prepare to the maintenance of overhead traction equipment/components	1.1	Works schedule(s), including drawings, plans, requirements, established procedures, and material lists, are received, analysed and confirmed, if necessary, by site inspection.
	1.2	Relevant requirements and established procedures for the work are communicated to all personnel and identified for all work sites.
	1.3	OHS policies and procedures related to requirements and established procedures for the maintenance of overhead traction equipment/components are obtained and confirmed for the purposes of the work to be performed and communicated.
	1.4	Work is prioritised and sequenced following consultation with others for completion within acceptable timeframes and in accordance with established procedures.
	1.5	Hazards are identified; OHS risks assessed and control measures are prioritised, implemented and monitored including emergency exits kept clear according to established procedures.

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ELEMENT		PERFORMANCE CRITERIA	
		1.6	Relevant work permits are obtained to access and perform work according to requirements and/or established procedures.
		1.7	Resources including personnel, equipment, tools and personal protective equipment required for the job are obtained and confirmed in working order.
		1.8	Relevant personnel at worksite are confirmed current in CPR, First Aid, and other rescue procedures according to requirements.
		1.9	Liaison and communication issues with other authorised personnel, authorities, clients and land owners are resolved to carry out work where necessary.
		1.10	Site is prepared according to the work schedule and to minimise risk and damage to property, commerce, and individuals in accordance with established procedures.
		1.11	Personnel participating in the work, including plant operators and contractors, are fully briefed and respective responsibilities confirmed where applicable in accordance with established procedures.
		1.12	Rail/road signs, barriers and warning devices are positioned in accordance with requirements.
		1.13	Environmental constraints applicable to work are identified and control measures are applied.
2	Carry out the maintenance of overhead traction equipment/components	2.1	OHS and sustainable energy principles and practices to reduce the incidents of accidents and minimise waste are monitored and followed in accordance with requirements and/or established procedures.
		2.2	Lifting, climbing, working aloft, and use of power tools/equipment, techniques and practices are safely followed and, currency according to requirements confirmed.
		2.3	Systems and circuits are isolated as required,

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ELEMENT	PERFORMANCE CRITERIA	
		proved safe to work on in accordance with the requirements/permits and established procedures.
	2.4	Essential knowledge and associated skills are applied in the safe maintenance of overhead traction equipment/components to ensure completion in an agreed timeframe and, to quality standards with a minimum of waste according to requirements.
	2.5	Electrical component/equipment and associated hardware is ascertained as operating within normal operating parameters and in accordance with requirements and established procedures.
	2.6	Maintenance, including repair and/or replacement of overhead traction equipment/components is carried out, in accordance with the work schedule and requirements/established procedures.
	2.7	Hazard warnings and safety signs are recognised and hazards and assessed OHS risks are reported to the immediate authorised persons for directions according to established procedures.
	2.8	Unplanned events during the maintenance of overhead traction equipment/components are undertaken within the scope of established procedures.
	2.9	Known solutions to a variety of problems are applied using acquired essential knowledge and associated skills.
	2.10	Ongoing checks/visual inspection of work quality are undertaken in accordance with instructions and established procedures.
3 Complete the maintenance of overhead traction equipment/components	3.1	Work undertaken is checked and or tested against works schedule for conformance with requirements and anomalies reported in accordance with established procedures.
	3.2	Work site is rehabilitated, cleaned up and made safe in accordance with established procedures.

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ELEMENT	PERFORMANCE CRITERIA	
	3.3	Tools, equipment and any surplus resources and materials are, where appropriate, cleaned, checked and returned to storage in accordance with established procedures.
	3.4	Relevant work permit(s) are signed off after final inspections and the system is energised, tested and returned to service in accordance with requirements.
	3.5	Works completion records, reports, as installed /modified drawing and/or documentation and information are finalised and processed and appropriate personnel notified.

Required Skills and Knowledge

REQUIRED SKILLS AND KNOWLEDGE

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REQUIRED SKILLS AND KNOWLEDGE

8) Essential Knowledge and Associated Skills (EKAS): This describes the essential skills and knowledge and their level, required for this unit.

Evidence shall show that knowledge of maintaining overhead traction equipment and components has been acquired.

All knowledge and skills detailed in this unit should be contextualised to current industry practices and technologies.

KS01-TRT28A Maintain overhead traction equipment and components

Evidence shall show an understanding of the maintenance of overhead traction equipment and components indicated by the following aspects:

T1 Overhead traction equipment encompassing:

- Types
- Purpose
- (Note: Examples include switches/isolators, fuse switches, links, section insulators, and fuses)

T2 Types of overhead components encompassing:

- Types
- Purpose
- (Note: Examples include cantilever hardware, droppers, bay components, portal hardware, head span hardware, section insulators, neutral sections, registration fittings, steady span, tension regulators and cross spans)

T3 Types of conductors used for overheads wiring such as hard-drawn, CAD, and tin-bearing copper, aluminium, steel, and other alloyed conductors

T4 Types of traction wire support structures that may consist of portals, cantilevers, drop pieces, head spans, cross spans and pull-offs

T5 Ancillary equipment

- Types
- Purpose
- (Note: Examples include surge arresters, booster and auxiliary transformers)

T6 Methods for replacing conductors that may consist the use of:

- Preformed fittings
- Compression fittings
- Wedged fittings
- Bolted splices
- Lugs
- Bolted clamps

T7 Methods for replacing components such as:

- Feeders
- Droppers
- Dissimilar conductors
- Jumpers
- Surge arresters

T8 Use of plant and equipment for maintenance work, such as:

- Elevating work platforms

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Evidence Guide

EVIDENCE GUIDE

9) This provides essential advice for assessment of the competency standard unit and must be read in conjunction with the Performance Criteria and the range statement of the competency standard unit and the Training Package Assessment Guidelines.

The Evidence Guide forms an integral part of this Competency Standard Unit and shall be used in conjunction with all component parts of this unit and, performed in accordance with the Assessment Guidelines of this Training Package.

Overview of Assessment **9.1)**

Longitudinal competency development approaches to assessment, such as Profiling, require data to be reliably gathered in a form that can be consistently interpreted over time. This approach is best utilised in Apprenticeship programs and reduces assessment intervention. It is the Industry's preferred model for apprenticeships. However, where summative (or final) assessment is used it is to include the application of the competency in the normal work environment or, at a minimum, the application of the competency in a realistically simulated work environment. It is recognised that, in some circumstances, assessment in part or full can occur outside the workplace. However, it must be in accord with Industry and, Regulatory policy in this regard.

Methods chosen for a particular assessment will be influenced by various factors. These include the extent of the assessment, the most effective locations for the assessment activities to take place, access to physical resources, additional safety measures that may be required and the critical nature of the competencies being assessed.

The critical safety nature of working with electricity, electrical equipment, gas or any other hazardous substance/material carries risk in deeming a person competent. Hence, sources of evidence need to be 'rich' in nature so as to minimise error in judgment.

Activities associated with normal every day work have a bearing on the decision as to how much and how detailed the data gathered will contribute to its 'richness'. Some skills are more critical to safety and operational requirements while the same skills may be more or less frequently practiced. These points are raised for the assessors to consider when choosing an assessment method and

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developing assessment instruments. Sample assessment instruments are included for Assessors in the Assessment Guidelines of this Training Package.

Critical aspects of evidence required to demonstrate competency in this unit

9.2)

Before the critical aspects of evidence are considered all prerequisites shall be met.

Evidence for competence in this unit shall be considered holistically. Each element and associated Performance Criteria shall be demonstrated on at least two occasions in accordance with the "Assessment Guidelines – UET12". Evidence shall also comprise:

- A representative body of Performance Criteria demonstrated within the timeframes typically expected of the discipline, work function and industrial environment. In particular this shall incorporate evidence that shows a candidate is able to:
  - Implement Occupational Health and Safety workplace procedures and practices including the use of risk control measures as specified in the Performance Criteria and range; and
  - Apply sustainable energy principles and practices as specified in the Performance Criteria and range; and
  - Demonstrate an understanding of the essential knowledge and associated skills as described in this unit to such an extent that the learner's performance outcome is reported in accordance with the preferred approach; namely a percentile graded result, where required by the regulated environment; and
  - Demonstrate an appropriate level of employability skills; and
- Conduct work observing the relevant Anti Discrimination legislation, regulations, policies and workplace procedures; and
  - Demonstrated performance across a representative range of contexts from the prescribed items below:

Range of tools/equipment/materials/procedures/workplaces/other

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variables		
Group No	**The minimum number of items on which skill is to be demonstrated**	**Item List**
A	At least two of the following:	Fuse switches Dropout fuses Section insulators Switches/isolators Links Fuses Surge diverters Transformers
B	At least five of the following:	Cantilever hardware Head span Neutral sections Pull offs Registration fittings Steady span Tension regulators Cross spans Tramway support network Pendulum
C	At least two of the following:	Preformed fittings Compression fittings Wedge fittings Bolted splices
D	At least three of the following:	Feeders Dissimilar conductors Lugs Bolted clamp Drapes/potential

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		jumper Droppers
E	At least two of the following:	Voltage detectors Micrometer/gauge Tension wrench Dynamometer Specialised tools
F	At least one occasion	Dealing with an unplanned event by drawing on essential knowledge and associated skills to provide appropriate solutions incorporated in the holistic assessment with the above listed items.

Context of and specific resources for assessment **9.3)**

This unit should be assessed as it relates to normal work practice using procedures, information and resources typical of a workplace. This should include:

- OHS policy and work procedures and instructions.
- Suitable work environment, facilities, equipment and materials to undertake actual maintenance of overhead traction equipment and components.

In addition to the resources listed above, in context of and specific resources for assessment, evidence should show demonstrated competency working maintaining overhead traction equipment and components, with different structural/construction types and method and in a variety of environments.

Method of assessment **9.4)**

This Competency Standard Unit shall be assessed by methods

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given in Volume 1, Part 3 “Assessment Guidelines”.

Note:

Competent performance with inherent safe working practices is expected in the Transmission, Distribution and Rail Traction Industry. This requires that the specified essential knowledge and associated skills are assessed in a structured environment which is primarily intended for learning/assessment and incorporates all necessary equipment and facilities for learners to develop and demonstrate the essential knowledge and associated skills described in this unit.

Concurrent assessment and relationship with other units

9.5)

For optimisation of training and assessment effort, competence in this unit may be assessed concurrently with the following units:

UETTDRRT22A	Maintain traction overhead wiring systems
UETTDRRT27A	Install overhead traction components and equipment

Range Statement

RANGE STATEMENT

10) This relates to the competency standard unit as a whole providing the range of contexts and conditions to which the Performance Criteria apply. It allows for different work environments and situations that will affect performance.

This Competency Standard Unit shall be demonstrated in relation to the maintenance, visual inspection and pre-commissioning tests of the overhead traction electrical equipment and components as well as associated hardware including ancillary equipment.

Maintenance may include the carrying out of diagnostics and tests on conductors, equipment, systems as well as the removal, repair and replacement of cables, conductors, and associated hardware and returning such to operational service.

Types of traction wire support structures may consist of portals, pull-off, drop-pieces, head spans, cross spans and tramway support networks.

Types of traction components may include droppers, bay components, cantilever

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RANGE STATEMENT

hardware, portal hardware, steady spans hardware, steady spans, insulators, pull-off arms, tension regulators, section insulators, neutral sections, tramway frogs, pendulums, crossing pans, ears/hangers, booster and auxiliary transformers, air break switches, in-span feeders, isolation switches, knuckles (insulated and non-insulated) and cross arms..

Traction system components may consist of metalwork, wires, hardware, fittings and insulators.

Types of conductor may include HD, CAD, and tin bearing copper, aluminium, steel, aluminium conductor steel reinforced and copper cover steel.

Types of wiring arrangements include single wire/tram systems, simple and compound catenary systems.

Plant may include ladders, elevating work platforms, winches, specialist tension string equipment, cable trailers, work trains, rail mounted overhead wiring equipment/vehicles and road rail mounted overhead wiring equipment/vehicles.

Ancillary equipment may include, transformers, switches, and surge diverters.

The following constants and variables included in the element/Performance Criteria in this unit are fully described in the Definitions Section 1 of this volume and form an integral part of the Range Statement of this unit:

- Appropriate and relevant persons (see Personnel)
- Appropriate authorities
- Appropriate work platform
- Assessing risk
- Assessment
- Authorisation
- Confined space
- Diagnostic, testing and restoration
- Documenting detailed work events, record keeping and or storage of information
- Drawings and specifications
- Emergency
- Environmental and sustainable energy procedures
- Environmental legislation
- Environmental management documentation
- Established procedures
- Fall prevention
- Hazards
- Identifying hazards
- Inspect
- Legislation

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RANGE STATEMENT

- MSDS
- Notification
- OHS practices
- OHS issues
- Permits and/or permits to work
- Personnel
- Quality assurance systems
- Requirements
- Testing procedures
- Work clearance systems

Unit Sector(s)

Not applicable.

Competency Field

Competency Field **11)**

Rail Traction Units

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UETTDRTP26A Install transmission structures and associated hardware

Modification History

Not applicable.

Unit Descriptor

Unit Descriptor **1) Scope:**

1.1) Descriptor

This Competency Standard Unit covers the erection of non-energised, pyramid, delta, Pi or enterprise specific transmission towers and associated hardware. It includes the erection of components in accordance with construction plans, specifications, work orders and standing enterprise requirements. Erection could also involve cleaning and welding. The updating of system data, records and or completion of relevant documentation in accordance with enterprise requirements also forms part of this competency.

Application of the Unit

Application of the Unit **2)**

This Competency Standard Unit is intended to augment formally acquired competencies. It is suitable for employment-based programs under an approved contract of training.

Licensing/Regulatory Information

License to practice **3)**

The skills and knowledge described in this unit may require a licence/registration to practice in the work place subject to regulations for undertaking of electrical work. Practice in workplace and during training is also subject to

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License to practice **3)**

regulations directly related to Occupational Health and Safety, electricity/telecommunications/gas/water industry safety and compliance, industrial relations, environmental protection, anti discrimination and training. Commonwealth, State/Territory or Local Government legislation and regulations may exist that limits the age of operating certain equipment.

Pre-Requisites

Prerequisite Unit(s) **4)**

Competencies **4.1)**

Granting of competency in this unit shall be made only after competency in the following unit(s) has/have been confirmed.

Where pre-requisite pathways have been identified. All competencies in the Common Unit Group must be have been completed.

Common Unit Group

Unit Code	Unit Title
UEENEEE101A	Apply Occupational Health and Safety regulations, codes and practices in the workplace
UEENEEE102A	Fabricate, assemble and dismantle utilities industry components
UEENEEE105A	Fix and secure electrotechnology equipment
UEENEEE107A	Use drawings, diagrams, schedules, standards, codes and specifications
UETTDREL11A	Apply sustainable energy and environmental procedures
UETTDREL16A	Working safely near live electrical apparatus

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Literacy and numeracy skills **4.2)**

Participants are best equipped to achieve this unit if they have reading, writing and numeracy skills indicated by the following scales. Description of each scale is given in Volume 2, Part 3 “Literacy and Numeracy”

Reading	3	Writing	3	Numeracy	3

Employability Skills Information

Employability Skills **5)**

The required outcomes described in this unit of competency contain applicable facets of Employability Skills. The Employability Skills Summary of the qualification in which this unit of competency is packaged will assist in identifying Employability Skill requirements.

Elements and Performance Criteria Pre-Content

6) Elements describe the essential outcomes of a competency standard unit

Performance Criteria describe the required performance needed to demonstrate achievement of the element. Assessment of performance is to be consistent with the Evidence Guide.

Elements and Performance Criteria

ELEMENT	PERFORMANCE CRITERIA
1 Prepare to erect transmission towers and associated hardware	1.1 Works schedule(s), including drawings, plans, requirements, established procedures, and material lists, are received, analysed and confirmed, if necessary, by site inspection.
	1.2 Relevant requirements and established procedures for the work are communicated to all personnel and identified for all work sites.

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ELEMENT	PERFORMANCE CRITERIA	
	1.3	OHS policies and procedures related to requirements and established procedures for the erect towers and associated hardware are obtained and confirmed for the purposes of the work to be performed and communicated.
	1.4	Work is prioritised and sequenced following consultation with others for completion within acceptable timeframes and in accordance with established procedures.
	1.5	Hazards are identified, OHS risks assessed and control measures are prioritised, implemented and monitored including emergency exits kept clear according to established procedures.
	1.6	Relevant work permits are obtained to access and perform work according to requirements and/or established procedures.
	1.7	Resources including personnel, equipment, tools and personal protective equipment required for the job are obtained and confirmed in working order.
	1.8	Relevant personnel at work site are confirmed current in First Aid, Tower/Pole Top Rescue and other related work procedures according to requirements.
	1.9	Liaison and communication issues with other/authorised personnel, authorities, clients and land owners are resolved to carry out work where necessary.
	1.10	Personnel participating in the work, including plant operators and contractors, are fully briefed and respective responsibilities confirmed where applicable in accordance with established procedures.
	1.11	Site is prepared according to the work schedule and to minimise risk and damage to property, commerce, and individuals in accordance with established procedures.
	1.12	Traffic management plan is identified and

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ELEMENT	PERFORMANCE CRITERIA	
		implemented.
2 Carry out the erection of transmission towers and associated hardware	2.1	OHS, sustainable energy and environmental principles and practices to reduce the incidents of accidents and minimise waste are monitored and followed in accordance with requirements and/or established procedures.
	2.2	Lifting, climbing, working aloft, and use of power tools/equipment, techniques and practices are safely followed and, currency according to requirements confirmed.
	2.3	Essential knowledge and associated skills are applied in the safe erection of towers and associated hardware to ensure completion in an agreed timeframe and, to quality standards with a minimum of waste according to requirements.
	2.4	Towers and associated hardware to be erected are stabilised according to requirements.
	2.5	Hazard warnings and safety signs are recognised and hazards and assessed OHS risks are reported to the immediate authorised persons for directions according to established procedures.
	2.6	Erection of towers and associated hardware is carried out, in accordance with the work schedule and requirements/established procedures.
	2.7	Unplanned events in the erection of towers and associated hardware are undertaken within the scope of established procedures.
	2.8	Known solutions to a variety of problems are applied using acquired essential knowledge and associated skills.
	2.9	Ongoing checks of quality of the work are undertaken in accordance with instructions and established procedures.
3 Complete the erection of transmission towers and associated hardware	3.1	Work undertaken is checked against works schedule for conformance with requirements and anomalies reported in accordance with established procedures.

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ELEMENT	PERFORMANCE CRITERIA
	3.2 Accidents and/or injuries are reported in accordance with requirements/established procedures, where applicable.
	3.3 Work site is rehabilitated, cleaned up and made safe in accordance with established procedures.
	3.4 Tools, equipment and any surplus resources and materials are, where appropriate, cleaned, checked and returned to storage or disposed of in accordance with established procedures.
	3.5 Relevant work permit(s) are signed off and, towers and associated hardware are returned to service in accordance with requirements.
	3.6 Works completion records, reports, as installed /modified drawing and/or documentation and information are finalised and processed and appropriate personnel notified.

Required Skills and Knowledge

REQUIRED SKILLS AND KNOWLEDGE

8) Essential Knowledge and Associated Skills (EKAS): This describes the essential skills and knowledge and their level, required for this unit.

Evidence shall show that knowledge has been acquired of erecting transmission towers and associated hardware.

All knowledge and skills detailed in this unit should be contextualised to current industry practices and technologies.

KS01-TTP26A Transmission structures and hardware

Evidence shall show an understanding of transmission structures and hardware to an extent indicated by the following aspects:

T1 Requirements for the use of enterprise construction manuals, system diagrams/plans and drawings

T2 Types of structures

T3 Types and function of associated hardware/equipment and insulators

T4 Types of conductors

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REQUIRED SKILLS AND KNOWLEDGE

T5 Location of transmissions structures

T6 Other equipment used on transmission structures, e.g. aircraft warning devices

T7 Voltages on transmission structures

T8 Traffic management

- Note: Examples include purpose of traffic management and a power worker's responsibilities in accordance with relevant statutory requirements and electricity supply industry requirements, demonstration of the procedure used to provide an effective traffic management scheme and the use of a two-way radio

T9 Classification and identification of equipment, components and tools

T10 Procedures for purchasing/ordering items, removing/dispatching items, stocktaking, and record keeping

T11 Safe working practices encompassing:

- Requirements to enable safe working on conductive poles
- Safe working practices when working with associated hardware/equipment and insulators
- Precautions of voltages on transmission structures
- Safe working practices when using specialised equipment

Evidence Guide

EVIDENCE GUIDE

9) This provides essential advice for assessment of the unit of competency and must be read in conjunction with the Performance Criteria and the Range Statement of the unit of competency and the Training Package Assessment Guidelines.

The Evidence Guide forms an integral part of this Competency Standard Unit and shall be used in conjunction with all component parts of this unit and, performed in accordance with the Assessment Guidelines of this Training Package.

Overview of Assessment **9.1)**

Longitudinal competency development approaches to assessment, such as Profiling, require data to be reliably gathered in a form that can be consistently interpreted over time. This approach is best utilised in Apprenticeship programs and reduces assessment intervention. It is the Industry's preferred model for apprenticeships. However, where summative (or final) assessment

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is used it is to include the application of the competency in the normal work environment or, at a minimum, the application of the competency in a realistically simulated work environment. It is recognised that, in some circumstances, assessment in part or full can occur outside the workplace. However, it must be in accord with Industry and, Regulatory policy in this regard.

Methods chosen for a particular assessment will be influenced by various factors. These include the extent of the assessment, the most effective locations for the assessment activities to take place, access to physical resources, additional safety measures that may be required and the critical nature of the competencies being assessed.

The critical safety nature of working with electricity, electrical equipment, gas or any other hazardous substance/material carries risk in deeming a person competent. Hence, sources of evidence need to be 'rich' in nature so as to minimise error in judgment.

Activities associated with normal every day work have a bearing on the decision as to how much and how detailed the data gathered will contribute to its 'richness'. Some skills are more critical to safety and operational requirements while the same skills may be more or less frequently practiced. These points are raised for the assessors to consider when choosing an assessment method and developing assessment instruments. Sample assessment instruments are included for Assessors in the Assessment Guidelines of this Training Package.

Critical aspects of evidence required to demonstrate competency in this unit

9.2)

Before the critical aspects of evidence are considered all prerequisites shall be met.

Evidence for competence in this unit shall be considered holistically. Each element and associated Performance Criteria shall be demonstrated on at least two occasions in accordance with the "Assessment Guidelines – UET12". Evidence shall also comprise:

- A representative body of Performance Criteria demonstrated within the timeframes typically expected of the discipline, work function and industrial environment. In particular this shall incorporate evidence that shows a candidate is able to:

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- Implement Occupational Health and Safety workplace procedures and practices including the use of risk control measures as specified in the Performance Criteria and range; and;
- Apply sustainable energy principles and practices as specified in the Performance Criteria and range; and
- Demonstrate an understanding of the essential knowledge and associated skills as described in this unit to such an extent that the learner's performance outcome is reported in accordance with the preferred approach; namely a percentile graded result, where required by the regulated environment; and
- Demonstrate an appropriate level of employability skills; and

- Conduct work observing the relevant Anti Discrimination legislation, regulations, policies and workplace procedures; and
  - Demonstrated performance across a representative range of contexts from the prescribed items below:

Range of tools/equipment/materials/procedures/workplaces/other variables		
Group No	**The minimum number of items on which skill is to be demonstrated**	**Item List**
A	Any one of the following:	Pyramid Delta pi Enterprise specific type
B	At least two of the following:	Insulators Clamps Bolts Structural components
C	At least one of the following:	Welding Cleaning
D	At least one occasion	Dealing with an unplanned event by drawing on essential knowledge and

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		associated skills to provide appropriate solutions incorporated in the holistic assessment with the above listed items.

Context of and specific resources for assessment **9.3)**

This unit should be assessed as it relates to normal work practice using procedures, information and resources typical of a workplace. This should include:

- OHS policy and work procedures and instructions.
- Suitable work environment, facilities, equipment and materials to undertake actual erection of towers and associated equipment.

In addition to the resources listed above, in Context of and specific resources for assessment, evidence should show demonstrated competency working below ground, in limited spaces, with different structural/construction types and method and in a variety of environments.

Method of assessment **9.4)**

This Competency Standard Unit shall be assessed by methods given in Volume 1, Part 3 “Assessment Guidelines”.

Note:

Competent performance with inherent safe working practices is expected in the Transmission, Distribution and Rail Traction Industry. This requires that the specified essential knowledge and associated skills are assessed in a structured environment which is primarily intended for learning/assessment and incorporates all necessary equipment and facilities for learners to develop and demonstrate the essential knowledge and associated skills described in this unit.

Concurrent **9.5)**

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assessment and relationship with other units

There are no concurrent assessment recommendations for this unit.

Range Statement

RANGE STATEMENT

10) This relates to the unit of competency as a whole providing the range of contexts and conditions to which the Performance Criteria apply. It allows for different work environments and situations that will affect performance.

This Competency Standard Unit shall be demonstrated in relation to the erection of non-energised, pyramid, delta, Pi or enterprise specific towers in accordance with construction plans and specifications

Tower types may include pyramid, delta and pi and other enterprise specific types.

The following constants and variables included in the element/Performance Criteria in this unit are fully described in the Definitions Section 1 of this volume and form an integral part of the Range Statement of this unit:

- Appropriate and relevant persons (see Personnel)
- Appropriate authorities
- Appropriate work platform
- Assessing risk
- Assessment
- Authorisation
- Diagnostic, testing and restoration
- Documenting detail work events, record keeping and or storage of information
- Drawings and specifications
- Emergency
- Environmental and sustainable energy procedures
- Environmental legislation
- Environmental management documentation
- Established procedures
- Fall prevention
- Hazards
- Identifying hazards
- Inspect
- Legislation

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RANGE STATEMENT

- MSDS
- Notification
- OHS practices
- OHS issues
- Permits and/or permits to work
- Personnel
- Quality assurance systems
- Requirements
- Testing procedures
- Work clearance systems

Unit Sector(s)

Not applicable.

Competency Field

Competency Field **11)**

Transmission Units

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UETTDRTP27A Maintain transmission structures and associated hardware

Modification History

Not applicable.

Unit Descriptor

Unit Descriptor **1) Scope:**

1.1) Descriptor

This Competency Standard Unit covers the maintenance of non-energised, pyramid, delta, Pi or enterprise specific transmission towers and associated hardware. It includes the repair, and or replacement of components in accordance with construction plans, specifications, work orders and standing enterprise requirements. Maintenance could also involve cleaning and welding. The updating of system data, records and or completion of relevant documentation in accordance with enterprise requirements also forms part of this competency.

Application of the Unit

Application of the Unit **2)**

This Competency Standard Unit is intended to augment formally acquired competencies. It is suitable for employment-based programs under an approved contract of training.

Licensing/Regulatory Information

License to practice **3)**

The skills and knowledge described in this unit may require a licence/registration to practice in the work place subject to regulations for undertaking of electrical work. Practice in workplace and during training is also subject to

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License to practice **3)**

regulations directly related to Occupational Health and Safety, electricity/telecommunications/gas/water industry safety and compliance, industrial relations, environmental protection, anti discrimination and training. Commonwealth, State/Territory or Local Government legislation and regulations may exist that limits the age of operating certain equipment.

Pre-Requisites

Prerequisite Unit(s) **4)**

Competencies **4.1)**

Granting of competency in this unit shall be made only after competency in the following unit(s) has/have been confirmed.

Where pre-requisite pathways have been identified. All competencies in the Common Unit Group must be have been completed.

Common Unit Group

Unit Code	Unit Title
UEENEEE101A	Apply Occupational Health and Safety regulations, codes and practices in the workplace
UEENEEE102A	Fabricate, assemble and dismantle utilities industry components
UEENEEE105A	Fix and secure electrotechnology equipment
UEENEEE107A	Use drawings, diagrams, schedules, standards, codes and specifications
UETTDREL11A	Apply sustainable energy and environmental procedures
UETTDREL16A	Working safely near live electrical apparatus
UETTDRTP26A	Install transmission structures and

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Prerequisite Unit(s) **4)**

associated hardware

Literacy and numeracy skills **4.2)**

Participants are best equipped to achieve this unit if they have reading, writing and numeracy skills indicated by the following scales. Description of each scale is given in Volume 2, Part 3 “Literacy and Numeracy”

Reading 3 Writing 3 Numeracy 3

Employability Skills Information

Employability Skills **5)**

The required outcomes described in this unit of competency contain applicable facets of Employability Skills. The Employability Skills Summary of the qualification in which this unit of competency is packaged will assist in identifying Employability Skill requirements.

Elements and Performance Criteria Pre-Content

6) Elements describe the essential outcomes of a competency standard unit

Performance Criteria describe the required performance needed to demonstrate achievement of the element. Assessment of performance is to be consistent with the Evidence Guide.

Elements and Performance Criteria

ELEMENT	PERFORMANCE CRITERIA
1 Prepare to maintain transmission towers and associated hardware	1.1 Works schedule(s), including drawings, plans, requirements, established procedures, and material lists, are received, analysed and confirmed, if necessary, by site inspection.

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ELEMENT	PERFORMANCE CRITERIA	
	1.2	Relevant requirements and established procedures for the work are communicated to all personnel and identified for all work sites.
	1.3	OHS policies and procedures related to requirements and established procedures for the maintenance of towers and associated hardware are obtained and confirmed for the purposes of the work to be performed and communicated.
	1.4	Work is prioritised and sequenced following consultation with others for completion within acceptable timeframes and in accordance with established procedures.
	1.5	Hazards are identified, OHS risks assessed and control measures are prioritised, implemented and monitored including emergency exits kept clear according to established procedures.
	1.6	Resources including personnel, equipment, tools and personal protective equipment required for the job are obtained and confirmed in working order.
	1.7	Relevant work permits are obtained to access and perform work according to requirements and/or established procedures.
	1.8	Relevant personnel at work site are confirmed current in First Aid, Pole Tower/Top Rescue and other related work procedures according to requirements.
	1.9	Liaison and communication issues with other/authorised personnel, authorities, clients and land owners are resolved to carry out work where necessary.
	1.10	Site is prepared according to the work schedule and to minimise risk and damage to property, commerce, and individuals in accordance with established procedures.
	1.11	Personnel participating in the work, including plant operators and contractors, are fully briefed and respective responsibilities confirmed where

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ELEMENT	PERFORMANCE CRITERIA	
		applicable in accordance with established procedures.
	1.12	Traffic management plan is identified and implemented.
2 Carry out the maintenance of transmission towers and associated hardware	2.1	OHS, sustainable energy and environmental principles and practices to reduce the incidents of accidents and minimise waste are monitored and followed in accordance with requirements and/or established procedures.
	2.2	Towers and associated hardware to be erected are stabilised according to requirements.
	2.3	Lifting, climbing, working aloft, and use of power tools/equipment, techniques and practices are safely followed and, currency according to requirements confirmed.
	2.4	Essential knowledge and associated skills are applied in the safe erection of towers and associated hardware to ensure completion in an agreed timeframe and, to quality standards with a minimum of waste according to requirements.
	2.5	Hazard warnings and safety signs are recognised and hazards and assessed OHS risks are reported to the immediate authorised persons for directions according to established procedures.
	2.6	Maintenance, including repair and/or replacement of towers is carried out, in accordance with the work schedule and requirements/established procedures.
	2.7	Unplanned events in the erection of towers and associated hardware are undertaken within the scope of established procedures.
	2.8	Known solutions to a variety of problems are applied using acquired essential knowledge and associated skills.
	2.9	Ongoing checks of quality of the work are undertaken in accordance with instructions and established procedures.

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ELEMENT	PERFORMANCE CRITERIA	
3 Complete the maintenance of transmission towers and associated hardware	3.1	Work undertaken is checked against works schedule for conformance with requirements and anomalies reported in accordance with established procedures.
	3.2	Accidents and/or injuries are reported in accordance with requirements/established procedures, where applicable.
	3.3	Work site is rehabilitated, cleaned up and made safe in accordance with established procedures.
	3.4	Tools, equipment and any surplus resources and materials are, where appropriate, cleaned, checked and returned to storage or disposed of in accordance with established procedures.
	3.5	Relevant work permit(s) are signed off and, towers and associated hardware are returned to service in accordance with requirements.
	3.6	Works completion records, reports, as installed /modified drawing and/or documentation and information are finalised and processed and appropriate personnel notified.

Required Skills and Knowledge

REQUIRED SKILLS AND KNOWLEDGE

8) Essential Knowledge and Associated Skills (EKAS): This describes the essential skills and knowledge and their level, required for this unit.

Evidence shall show that knowledge has been acquired of maintaining transmission towers and associated hardware.

All knowledge and skills detailed in this unit should be contextualised to current industry practices and technologies.

KS01-TTP27A Routine maintenance on transmission structures

Evidence shall show an understanding of procedures for routine maintenance on transmission structures and hardware to an extent indicated by the following aspects:

T1 Procedures for gaining access permits

T2 Reasons for gaining access

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REQUIRED SKILLS AND KNOWLEDGE

T3 Types of maintenance procedures on transmission structures encompassing:

- Procedure to follow for inspection/patrols according to the Transmission Supply Authority

T4 Erecting and removing of transmission equipment and hardware from a tower encompassing:

- Climbing procedures
- Square rigging principles
- Calculation of forces at work within a given square rigging system
- Construction of a square rigging system
- Procedures for changing insulators
- Note: Examples include vertical angle suspension, strain insulator, post insulator (horizontal or vertical) and bridge insulator, calculation of conductor forces

T5 Installation of temporary work platforms encompassing:

- Types and function of installation tools and equipment
- Precautions and work methods to follow
- Procedures for installations of temporary work platforms

T6 Installation of conductor protective hardware encompassing:

- Types and selection of common dampers, tools and equipment
- Control of Aeolian vibration
- Procedures for the installation of dampers onto conductors

T7 Dead line insulator washing encompassing:

- Supply Authority regulations
- Procedure for washing de-energised transmission lines

Evidence Guide

EVIDENCE GUIDE

9) This provides essential advice for assessment of the unit of competency and must be read in conjunction with the Performance Criteria and the Range Statement of the unit of competency and the Training Package Assessment Guidelines.

The Evidence Guide forms an integral part of this Competency Standard Unit and shall be used in conjunction with all component parts of this unit and, performed in accordance with the Assessment Guidelines of this Training Package.

Overview of 9.1)

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Assessment

Longitudinal competency development approaches to assessment, such as Profiling, require data to be reliably gathered in a form that can be consistently interpreted over time. This approach is best utilised in Apprenticeship programs and reduces assessment intervention. It is the Industry's preferred model for apprenticeships. However, where summative (or final) assessment is used it is to include the application of the competency in the normal work environment or, at a minimum, the application of the competency in a realistically simulated work environment. It is recognised that, in some circumstances, assessment in part or full can occur outside the workplace. However, it must be in accord with Industry and, Regulatory policy in this regard.

Methods chosen for a particular assessment will be influenced by various factors. These include the extent of the assessment, the most effective locations for the assessment activities to take place, access to physical resources, additional safety measures that may be required and the critical nature of the competencies being assessed.

The critical safety nature of working with electricity, electrical equipment, gas or any other hazardous substance/material carries risk in deeming a person competent. Hence, sources of evidence need to be 'rich' in nature so as to minimise error in judgment.

Activities associated with normal every day work have a bearing on the decision as to how much and how detailed the data gathered will contribute to its 'richness'. Some skills are more critical to safety and operational requirements while the same skills may be more or less frequently practiced. These points are raised for the assessors to consider when choosing an assessment method and developing assessment instruments. Sample assessment instruments are included for Assessors in the Assessment Guidelines of this Training Package.

Critical aspects of evidence required to demonstrate competency in this unit

9.2)

Before the critical aspects of evidence are considered all prerequisites shall be met.

Evidence for competence in this unit shall be considered holistically. Each element and associated Performance Criteria

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shall be demonstrated on at least two occasions in accordance with the "Assessment Guidelines – UET12". Evidence shall also comprise:

- A representative body of Performance Criteria demonstrated within the timeframes typically expected of the discipline, work function and industrial environment. In particular this shall incorporate evidence that shows a candidate is able to:
  - Implement Occupational Health and Safety workplace procedures and practices including the use of risk control measures as specified in the Performance Criteria and range; and
  - Apply sustainable energy principles and practices as specified in the Performance Criteria and range; and
  - Demonstrate an understanding of the essential knowledge and associated skills as described in this unit to such an extent that the learner's performance outcome is reported in accordance with the preferred approach; namely a percentile graded result, where required by the regulated environment; and
  - Demonstrate an appropriate level of employability skills; and
- Conduct work observing the relevant Anti Discrimination legislation, regulations, policies and workplace procedures; and
  - Demonstrated performance across a representative range of contexts from the prescribed items below:

Range of tools/equipment/materials/procedures/workplaces/other variables		
Group No	**The minimum number of items on which skill is to be demonstrated**	**Item List**
A	Any one of the following:	Pyramid Delta pi Enterprise specific type
B	At least two of the following	Insulators Clamps Bolts Structural components

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C	At least one of the following:	Welding Cleaning
D	At least one occasion	Dealing with an unplanned event by drawing on essential knowledge and associated skills to provide appropriate solutions incorporated in the holistic assessment with the above listed items.

Context of and specific resources for assessment **9.3)**

This unit should be assessed as it relates to normal work practice using procedures, information and resources typical of a workplace. This should include:

- OHS policy and work procedures and instructions.
- Suitable work environment, facilities, equipment and materials to undertake actual pre-tension stringing of transmission overhead conductors and cables.

In addition to the resources listed above, in Context of and specific resources for assessment, evidence should show demonstrated competency working below ground, in limited spaces, with different structural/construction types and method and in a variety of environments

Method of assessment **9.4)**

This Competency Standard Unit shall be assessed by methods given in Volume 1, Part 3 “Assessment Guidelines”.

Note:

Competent performance with inherent safe working practices is expected in the Transmission, Distribution and Rail Traction Industry. This requires that the specified essential knowledge and associated skills are assessed in a structured environment which is

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primarily intended for learning/assessment and incorporates all necessary equipment and facilities for learners to develop and demonstrate the essential knowledge and associated skills described in this unit.

Concurrent assessment and relationship with other units

9.5)

There are no concurrent assessment recommendations for this unit.

Range Statement

RANGE STATEMENT

10) This relates to the unit of competency as a whole providing the range of contexts and conditions to which the Performance Criteria apply. It allows for different work environments and situations that will affect performance.

This Competency Standard Unit shall be demonstrated in relation to the erection of non-energised, pyramid, delta, Pi or enterprise specific towers in accordance with construction plans and specifications

Tower types may include pyramid, delta and pi and other enterprise specific types.

Maintenance may include the removal, repair and replacement of tower components, including welding where appropriate; and the replacement, repair and cleaning of associated hardware.

The following constants and variables included in the element/Performance Criteria in this unit are fully described in the Definitions Section 1 of this volume and form an integral part of the Range Statement of this unit:

- Appropriate and relevant persons (see Personnel)
- Appropriate authorities
- Appropriate work platform
- Assessing risk
- Assessment
- Authorisation
- Diagnostic, testing and restoration
- Documenting detail work events, record keeping and or storage of information
- Drawings and specifications
- Emergency

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RANGE STATEMENT

- Environmental and sustainable energy procedures
- Environmental legislation
- Environmental management documentation
- Established procedures
- Fall prevention
- Hazards
- Identifying hazards
- Inspect
- Legislation
- MSDS
- Notification
- OHS practices
- OHS issues
- Permits and/or permits to work
- Personnel
- Quality assurance systems
- Requirements
- Testing procedures
- Work clearance systems

Unit Sector(s)

Not applicable.

Competency Field

Competency Field **11)**

Transmission Units

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UETTDRTP29A Install and maintain transmission overhead conductors and cables

Modification History

Not applicable.

Unit Descriptor

Unit Descriptor **1) Scope:**

1.1) Descriptor

This Competency Standard Unit covers the installation and maintenance of overhead conductors and cables used on towers which includes the stringing, tensioning and terminating of the conductor/cable while de energised, securing of the conductor to the insulators or supports and the undertaking of the electrical connections. It also covers maintenance work associated with the diagnosing of faults, the conducting of visual inspections, the confirmation of phasing and the completion of other enterprise tests. It also encompasses confirming isolation of systems and circuits, and/accepting/ issuing electrical permits and the updating of system data/maintenance records.

Application of the Unit

Application of the Unit **2)**

This Competency Standard Unit is intended to augment formally acquired competencies. It is suitable for employment-based programs under an approved contract of training.

Licensing/Regulatory Information

License to practice **3)**

The skills and knowledge described in this unit may

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License to practice **3)**

require a licence/registration to practice in the work place subject to regulations for undertaking of electrical work. Practice in workplace and during training is also subject to regulations directly related to Occupational Health and Safety, electricity/telecommunications/gas/water industry safety and compliance, industrial relations, environmental protection, anti discrimination and training. Commonwealth, State/Territory or Local Government legislation and regulations may exist that limits the age of operating certain equipment.

Pre-Requisites

Prerequisite Unit(s) **4)**

Competencies **4.1)**

Granting of competency in this unit shall be made only after competency in the following unit(s) has/have been confirmed.

Where pre-requisite pathways have been identified. All competencies in the Common Unit Group must be have been completed.

Common Unit Group

Unit Code	Unit Title
UEENEEE101A	Apply Occupational Health and Safety regulations, codes and practices in the workplace
UEENEEE102A	Fabricate, assemble and dismantle utilities industry components
UEENEEE105A	Fix and secure electrotechnology equipment
UEENEEE107A	Use drawings, diagrams, schedules, standards, codes and specifications
UETTDREL11A	Apply sustainable energy and environmental procedures

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Prerequisite Unit(s) **4)**

UETTDREL16A	Working safely near live electrical apparatus
UETTDRTP26A	Install transmission structures and associated hardware
UETTDRTP27A	Maintain transmission structures and associated hardware

Literacy and numeracy skills **4.2)**

Participants are best equipped to achieve this unit if they have reading, writing and numeracy skills indicated by the following scales. Description of each scale is given in Volume 2, Part 3 "Literacy and Numeracy"

Reading 3 Writing 3 Numeracy 3

Employability Skills Information

Employability Skills **5)**

The required outcomes described in this unit of competency contain applicable facets of Employability Skills. The Employability Skills Summary of the qualification in which this unit of competency is packaged will assist in identifying Employability Skill requirements.

Elements and Performance Criteria Pre-Content

6) Elements describe the essential outcomes of a competency standard unit

Performance Criteria describe the required performance needed to demonstrate achievement of the element. Assessment of performance is to be consistent with the Evidence Guide.

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Elements and Performance Criteria

ELEMENT	PERFORMANCE CRITERIA
1 Prepare for the installation and maintenance of overhead conductors and cables used on towers	1.1 Works schedule(s), including drawings, plans, requirements, established procedures, and material lists are received/ sourced, analysed and confirmed, if necessary, by site inspection.
	1.2 Relevant requirements and established procedures for the work are communicated to all personnel and identified for all work sites.
	1.3 OHS policies and procedures related to requirements and established procedures for the installation and maintenance of overhead conductors and cables used on towers are obtained and confirmed for the purposes of the work to be performed and communicated.
	1.4 Work is prioritised and sequenced following consultation with others for completion within acceptable timeframes and in accordance with established procedures.
	1.5 Hazards are identified, OHS risks assessed and control measures are prioritised, implemented and monitored including emergency exits kept clear according to established procedures.
	1.6 Relevant work permits are obtained to access and perform work according to requirements and/or established procedures.
	1.7 Resources including personnel, equipment, tools and personal protective equipment required for the job are obtained and confirmed in working order.
	1.8 Relevant personnel at work site are confirmed current in First Aid, Rescue and other related procedures according to requirements.
	1.9 Liaison and communication issues with other/authorised personnel, authorities, clients and land owners are resolved to carry out work where necessary.
	1.10 Site is prepared according to the work schedule

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ELEMENT		PERFORMANCE CRITERIA	
			and to minimise risk and damage to property, commerce, environment and individuals in accordance with established procedures.
		1.11	Personnel participating in the work, including plant operators and contractors, are fully briefed and respective responsibilities confirmed where applicable in accordance with established procedures.
		1.12	Traffic management plan is identified and implemented.
2	Carry out installation and maintenance of overhead conductors and cables used on towers	2.1	OHS, sustainable energy and environmental principles and practices to reduce the incidents of accidents and minimise waste are monitored and followed in accordance with requirements and/or established procedures.
		2.2	Lifting, climbing, working aloft, and use of power tools/equipment, techniques and practices are safely followed and, currency according to requirements confirmed.
		2.3	Systems and circuits are isolated as required, proved safe to work on in accordance with the requirements /permits and established procedures.
		2.4	Essential knowledge and associated skills are applied in the safe installation and maintenance of overhead conductors and cables used on towers to ensure completion in an agreed timeframe to quality standards with a minimum of waste according to requirements.
		2.5	Overhead conductor/cables are strung, tensioned and terminated as per requirements/established procedures.
		2.6	Conductors and anti-vibration devices, spaces/spreaders are secured as per established procedures.
		2.7	Electrical connections are made in accordance with the requirements/established procedures.

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ELEMENT		PERFORMANCE CRITERIA	
		2.8	Maintenance, including repair and/or replacement of overhead conductors and cables used on towers is carried out, in accordance with the work schedule and requirements/established procedures.
		2.9	Hazard warnings and safety signs are recognised and hazards and assessed OHS risks are reported to the immediate authorised persons for directions according to established procedures.
		2.10	Unplanned events in the installation and maintenance of overhead conductors and cables used on towers are undertaken within the scope of established procedures.
		2.11	Known solutions to a variety of problems are applied using acquired essential knowledge and associated skills.
		2.12	Ongoing checks of quality of the work are undertaken in accordance with instructions and established procedures.
3	Complete the installation and maintenance of overhead conductors and cables used on towers	3.1	Work undertaken is checked against works schedule for confirmation of phasing and conformance with requirements and, anomalies reported in accordance with established procedures.
		3.2	Accidents and/or injuries are reported in accordance with requirements/established procedures, where applicable.
		3.3	Work site is rehabilitated, cleaned up and made safe in accordance with established procedures.
		3.4	Tools, equipment and any surplus resources and materials are, where appropriate, cleaned, checked and returned to storage or disposed of in accordance with established procedures.
		3.5	Relevant work permit(s) are signed off and, overhead conductors and cables used on towers are returned to service in accordance with requirements.

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ELEMENT	PERFORMANCE CRITERIA
	3.6 Works completion records, reports, as installed /modified drawing and/or documentation and information are finalised and processed and appropriate personnel notified.

Required Skills and Knowledge

REQUIRED SKILLS AND KNOWLEDGE

8) Essential Knowledge and Associated Skills (EKAS): This describes the essential skills and knowledge and their level, required for this unit.

Evidence shall show that knowledge has been acquired of installing and maintaining overhead conductors and cables (towers).

All knowledge and skills detailed in this unit should be contextualised to current industry practices and technologies.

KS02-TTP29A Powerline transmission installation safety

Evidence shall show an understanding of the safe working practices and procedures for the installation of overhead transmission conductors to an extent indicated by the following aspects:

T1 Limits of approach for personnel, vehicles, mobile plant and elevating work platforms (EWP)

T2 Requirements of persons prior to making bare hand contact with dead low voltage mains and apparatus

T3 Requirements of relevant electrical access permits necessary to allow work to be performed on low and high voltage apparatus

T4 Safe working practices encompassing:

- Requirements to enable safe working on conductive poles
- Procedure to attach an on-site earthing device to de-energised low and high voltage overhead circuit
- Safe working practices when working with associated hardware/equipment and insulators
- Precautions of voltages on transmission structures
- Dangers when working at heights
- Identification of hazards, assessing and controlling risks
- Types, selection, maintenance and uses of personnel protective equipment
- Permit to work systems and isolation procedures
- Safe working practices when using specialised equipment
- Emergency response and rescue including First Aid etc

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Evidence Guide

EVIDENCE GUIDE

9) This provides essential advice for assessment of the unit of competency and must be read in conjunction with the Performance Criteria and the Range Statement of the unit of competency and the Training Package Assessment Guidelines.

The Evidence Guide forms an integral part of this Competency Standard Unit and shall be used in conjunction with all component parts of this unit and, performed in accordance with the Assessment Guidelines of this Training Package.

Overview of Assessment **9.1)**

Longitudinal competency development approaches to assessment, such as Profiling, require data to be reliably gathered in a form that can be consistently interpreted over time. This approach is best utilised in Apprenticeship programs and reduces assessment intervention. It is the Industry's preferred model for apprenticeships. However, where summative (or final) assessment is used it is to include the application of the competency in the normal work environment or, at a minimum, the application of the competency in a realistically simulated work environment. It is recognised that, in some circumstances, assessment in part or full can occur outside the workplace. However, it must be in accord with Industry and, Regulatory policy in this regard.

Methods chosen for a particular assessment will be influenced by various factors. These include the extent of the assessment, the most effective locations for the assessment activities to take place, access to physical resources, additional safety measures that may be required and the critical nature of the competencies being assessed.

The critical safety nature of working with electricity, electrical equipment, gas or any other hazardous substance/material carries risk in deeming a person competent. Hence, sources of evidence need to be 'rich' in nature so as to minimise error in judgment.

Activities associated with normal every day work have a bearing on the decision as to how much and how detailed the data gathered will contribute to its 'richness'. Some skills are more critical to safety and operational requirements while the same skills may be more or less frequently practiced. These points are raised for the assessors to consider when choosing an assessment method and

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developing assessment instruments. Sample assessment instruments are included for Assessors in the Assessment Guidelines of this Training Package.

Critical aspects of evidence required to demonstrate competency in this unit

9.2)

Before the critical aspects of evidence are considered all prerequisites shall be met.

Evidence for competence in this unit shall be considered holistically. Each element and associated Performance Criteria shall be demonstrated on at least two occasions in accordance with the "Assessment Guidelines – UET12". Evidence shall also comprise:

- A representative body of Performance Criteria demonstrated within the timeframes typically expected of the discipline, work function and industrial environment. In particular this shall incorporate evidence that shows a candidate is able to:
  - Implement Occupational Health and Safety workplace procedures and practices including the use of risk control measures as specified in the Performance Criteria and range; and
  - Apply sustainable energy principles and practices as specified in the Performance Criteria and range; and
  - Demonstrate an understanding of the essential knowledge and associated skills as described in this unit to such an extent that the learner's performance outcome is reported in accordance with the preferred approach; namely a percentile graded result, where required by the regulated environment; and
  - Demonstrate an appropriate level of employability skills; and
- Conduct work observing the relevant Anti Discrimination legislation, regulations, policies and workplace procedures; and
  - Demonstrated performance across a representative range of contexts from the prescribed items below:

Range of tools/equipment/materials/procedures/workplaces/other

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variables		
Group No	**The minimum number of items on which skill is to be demonstrated**	**Item List**
A	At least one of the following:	Copper Aluminium Steel Composite Aluminium/steel reinforced Pilot
B	At least two of the following:	Elevated work platform Portable platform Gondola Hook ladder* Elevated work box (*must do)
C	At least five of the following:	Winches* Tension equipment* Stringing equipment Cable trailers Crimping equipment * Pre-formed splices Hardware Cable drum stands Ropes Rollers/ sheaves Comealongs Swivels (*must do)
D	At least two of the following:	Voltage/ de-energised indicating device

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		Field intensity meter Operating rods (*must do)
E	At least one of the following:	Dynamometer Site board Abney level Sag chart* Theodolite (*must do)
F	At least one occasion	Dealing with an unplanned event by drawing on essential knowledge and associated skills to provide appropriate solutions incorporated in the holistic assessment with the above listed items.

Context of and specific resources for assessment **9.3)**

This unit should be assessed as it relates to normal work practice using procedures, information and resources typical of a workplace. This should include:

- OHS policy and work procedures and instructions.
- Suitable work environment, facilities, equipment and materials to undertake actual installation and maintenance of overhead conductors and cables on towers.

In addition to the resources listed above, in Context of and specific resources for assessment, evidence should show demonstrated competency working below ground, in limited spaces, with different structural/construction types and method and in a variety of environments

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Method of assessment **9.4)**

This Competency Standard Unit shall be assessed by methods given in Volume 1, Part 3 “Assessment Guidelines”.

Note:

Competent performance with inherent safe working practices is expected in the Transmission, Distribution and Rail Traction Industry. This requires that the specified essential knowledge and associated skills are assessed in a structured environment which is primarily intended for learning/assessment and incorporates all necessary equipment and facilities for learners to develop and demonstrate the essential knowledge and associated skills described in this unit.

Concurrent assessment and relationship with other units **9.5)**

There are no concurrent assessment recommendations for this unit.

Range Statement

RANGE STATEMENT

10) This relates to the unit of competency as a whole providing the range of contexts and conditions to which the Performance Criteria apply. It allows for different work environments and situations that will affect performance.

This Competency Standard Unit shall be demonstrated in relation to the installation and maintenance of overhead conductor and or cables used on transmission towers

Installation and maintenance may include the stringing, tensioning, terminating, removal, repairing and replacement of the conductors/cables. Visual inspections and the diagnosing of faults is also included.

Structures include towers and columns.

Types of conductor include copper, aluminium, steel and composites. Conductor configurations may be single or bundled and include pilot cables.

Overhead conductors include earthing systems

Plant may include elevating work platform, winches and capstans, specialist tension stringing equipment, cable trailers, cable drum stands and equipotential equipment.

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RANGE STATEMENT

Testing and recording equipment includes, insulation resistance testers, recording meters and other approved devices and techniques applicable to the voltage. .

The following constants and variables included in the element/Performance Criteria in this unit are fully described in the Definitions Section 1 of this volume and form an integral part of the Range Statement of this unit:

- Appropriate and relevant persons (see Personnel)
- Appropriate authorities
- Appropriate work platform
- Assessing risk
- Assessment
- Authorisation
- Diagnostic, testing and restoration
- Documenting detail work events, record keeping and or storage of information
- Drawings and specifications
- Emergency
- Environmental and sustainable energy procedures
- Environmental legislation
- Environmental management documentation
- Established procedures
- Fall prevention
- Hazards
- Identifying hazards
- Inspect
- Legislation
- MSDS
- Notification
- OHS practices
- OHS issues
- Permits and/or permits to work
- Personnel
- Quality assurance systems
- Requirements.
- Testing procedures
- Work clearance systems

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Unit Sector(s)

Not applicable.

Competency Field

Competency Field **11)**

Transmission Units

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UEP Electricity Supply Industry - Generation Sector Training Package

Modification History

Not applicable.

Credit Arrangements

Links

Companion Volume implementation guides are found in VETNet - https://vetnet.gov.au/Pages/TrainingDocs.aspx?q=1715b9fa-e7bd-441c-bb8d-cf22c9c825a8

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UEPSS00005 High Risk Licensing - Licence to operate a reciprocating steam engine

Modification History

This Skill Set replaces and is equivalent to UEPSS00001 High Risk Licencing - Licence to operate a reciprocating steam engine.

Description

This Skill Set UEPSS00005 Licence to operate a reciprocating steam engine provides the skills and knowledge required to operate reciprocating steam engines within the Australian UEP Electricity Supply Industry - Generation Sector Training Package environment.

Pathways Information

This Skill Set UEPSS00005 Licence to operate a reciprocating steam engine is part of the UEP Electricity Supply Industry - Generation Sector Training Package.

This Skill Set can be a stand alone licensing outcome, or the unit may be included in a qualification as a core or elective option.

Licensing/Regulatory Information

Personnel seeking certification as a licenced operator of a reciprocating steam engine are to comply with national High Risk Licensing requirements for operators of reciprocating steam engines.

Skill Set Requirements

A total of one unit of competency must be attained.

UEPOPL002	Licence to operate a reciprocating steam engine

Target Group

This is Skill Set UEPSS00005 Licence to operate a reciprocating steam engine is suitable for operators who require occupational licencing by a State or Territory WHS/OHS regulator.

Suggested words for Statement of Attainment

This Skill Set UEPSS00005 Licence to operate a reciprocating steam engine from the UEP

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Electricity Supply Industry - Generation Sector Training Package meets the minimum industry requirements for High Risk Licensing of operators of reciprocating steam engines.

Custom Content Section

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UEPSS00006 High Risk Licensing - Licence to operate a steam turbine

Modification History

This Skill Set replaces and is equivalent to UEPSS00002 High Risk Licensing - Licence to operate a steam turbine.

Description

This Skill Set UEPSS00006 Licence to operate a steam turbine provides the skills and knowledge required to perform the duties of an operator of steam turbines within the Australian UEP Electricity Supply Industry - Generation Sector Training Package environment.

Pathways Information

This Skill Set UEPSS00006 Licence to operate a steam turbine is part of the UEP Electricity Supply Industry - Generation Sector Training Package.

This Skill Set can be a stand alone licensing outcome, or the unit may be included in a qualification as a core or elective option.

Licensing/Regulatory Information

Personnel seeking certification as a licenced operator of a steam turbine are to comply with national High Risk Licensing requirements for operators of steam turbines.

Skill Set Requirements

A total of one unit of competency must be attained.

UEPOPL001	Licence to operate a steam turbine

Target Group

This is Skill Set UEPSS00006 Licence to operate a steam turbine is suitable for operators who require occupational licencing by a State or Territory WHS/OHS regulator.

Suggested words for Statement of Attainment

This Skill Set UEPSS00006 Licence to operate a steam turbine from the UEP Electricity Supply Industry - Generation Sector Training Package meets the minimum industry requirements for

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High Risk Licensing of operators of steam turbines.

Custom Content Section

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UEPSS00007 High Voltage Operation - H.V. switching programs

Modification History

This Skill Set replaces and is equivalent to UEPSS00003 High Voltage Operation - H.V. Switching.

Description

This Skill Set UEPSS00007 High Voltage Operation – H.V. switching programs provides the skills and knowledge required to operate H.V. switching programs within the Australian UEP Electricity Supply Industry - Generation Sector Training Package environment.

It includes undertaking the operation of high voltage circuit breaking devices, and the performance of H.V. switching for a given switching program.

It is essential that anyone undertaking this Skill Set must already hold a UEE33011 Certificate III in Electrical Fitting, or equivalent.

Pathways Information

This Skill Set UEPSS00007 High Voltage Operation – H.V. switching programs is part of the UEP Electricity Supply Industry - Generation Sector Training Package.

The units of competency in this Skill Set can contribute to the completion of relevant Certificate III, Certificate IV and Diploma qualifications from the UEP Electricity Supply Industry - Generation Sector Training Package.

Licensing/Regulatory Information

The skills and knowledge described in this Skill Set do not require a licence to practice in the workplace.

Skill Set Requirements

A total of two units of competency must be attained.

UEPOPS349	Operate local H.V. switchgear
UEPOPS456	Perform switching to a switching program

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Target Group

This Skill Set UEPSS00007 High Voltage Operation – H.V. switching programs is suitable for operators working in the UEP Electricity Supply Industry - Generation Sector Training Package environment

Suggested words for Statement of Attainment

This Skill Set UEPSS00007 High Voltage Operation – H.V. switching programs from the UEP Electricity Supply Industry - Generation Sector Training Package meets the minimum requirements for the development and coordination of H.V. switching programs.

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UEPSS00008 High Voltage Operation - Development and coordination of H.V. switching programs

Modification History

This Skill Set replaces and is equivalent to UEPSS00004 High Voltage Operation - Development and co-ordination of H.V. Switching Programs

Description

This Skill Set UEPSS00008 High Voltage Operation – Development and coordination of H.V. switching programs provides the skills and knowledge required to perform the duties of operating H.V. switching programs within the Australian UEP Electricity Supply Industry - Generation Sector Training Package environment.

It includes developing switching programs where multiple sources of supply must be considered, managed and coordinated including the control and management of H.V. substations and/or local networks.

It is essential that anyone undertaking this Skill Set must already hold a UEP30118 Certificate III in ESI Generation – Systems Operations, or equivalent.

Pathways Information

This Skill Set UEPSS00008 High Voltage Operation – Development and coordination of H.V. switching programs is part of the UEP Electricity Supply Industry - Generation Sector Training Package.

The units of competency in this Skill Set can contribute to the completion of relevant Certificate III, Certificate IV and Diploma qualifications from the UEP Electricity Supply Industry - Generation Sector Training Package.

Licensing/Regulatory Information

The skills and knowledge described in this Skill Set do not require a licence to practice in the workplace.

Skill Set Requirements

A total of two units of competency must be attained.

UEPOPS424	Coordinate local H.V. networks

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UEPOPS428 Develop H.V. switching programs

Target Group

This is Skill Set UEPSS00008 High Voltage Operation – Development and coordination of H.V. switching programs is suitable for operators working in the UEP Electricity Supply Industry - Generation Sector Training Package environment.

Suggested words for Statement of Attainment

This Skill Set UEPSS00008 High Voltage Operation – Development and coordination of H.V. switching programs from the UEP Electricity Supply Industry - Generation Sector Training Package meets the minimum requirements for the development and coordination of H.V. switching programs.

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